The Impact of Education on Awareness for frequently Occurring Natural Disasters (Cyclones) of the Island Dwellers in Sandwip, Chittagong, Bangladesh

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Abstract

The objective of the study was to examine the impact of education on awareness of natural disasters (Cyclones) of the island dwellers in Sandwip upazila of Chittagong district in Bangladesh. A total of 279 respondents have been interviewed through pre structured questionnaires in the Magdhara union of Sandwip upazila. The study sites and respondents have been selected purposively. Both descriptive and quantitative analyses were conducted. The impact of education of the respondents has positive and significant impact on the awareness of natural disasters on the respondents. It is also observed that awareness of disaster is affected by many other factors. The study is concluded with fewer suggestions for the future plan of the awareness of natural disasters in the coastal areas of Bangladesh.

Keywords: Natural disasters, education, awareness, Sandwip, Bangladesh.

INTRODUCTION

Every year natural disasters kill and affect close to 160 million people worldwide (Ian 2020). So, natural disasters have been burning issues in the world and greatest threat to the mankind. Every year Bangladesh faces many natural disasters like drought, flood, water logging, cyclone and tidal surge, tornado, thunderstorm, coastal erosion, landslides, salinity intrusion, hailstorm, extreme

weather events etc. Flood is the dangerous consequences of excessive rain. Flood hampers the normal life style of people (Mahmud 2020).

Cyclone is also a serious natural disaster. The cyclones of 1970 and 1991 were memorable for their unprecedented devastation in Bangladesh (Ibid). About a half million in 1970 and 150000 death in 1991 occurred in those two calamities (Mahmud 2020). Millions of people were shelter less,

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communication system had total destruction and all others had turned out disordered. Sidr in 15th November, 2007 was also a remarkable tornado in Bangladesh. The affected areas were Dublar char, Hironpoint, Barisal, Pirojpur and Patuakhali etc. The force of wind, tidal surge, and heavy rains collapsed the life style of the people. The power of the wind made the tinned rooms like papers freely. Hundreds of fishing trawlers which were unable to take safe shelters were drowned in the sea. People started roaring in fear. Electricity stopped totally throughout the country. Thousands of people died within few hours due to Sidr. The sea, rivers and canals were covered by the floating dead bodies. The scenario was completely a film of destruction. Cyclone affected districts were 31 and 200 upazilas (Mahmud 2020). Affected peoples were nearly 80 lakhs (Mahmud 2020) who became shelter less, food deprived and jobless. This is only a scenario of hundreds of natural calamities faced by the people of Bangladesh time to time. It is difficult to measure the losses in terms of money in many cases. Indeed, on an average the country experiences severe tropical cyclone every three years and about 25% of the land mass (Mahmud 2020) is inundated with flood water every year.

IMPORTANCE OF THE STUDY

Natural disasters like cyclones happen very often in the sea coastal areas of Bangladesh and many human lives and properties are lost. The recent cyclone Amphan is no more exception to this general scenario either in Bangladesh or India (Dhaka Tribune 2020). It is said that the impact of Amphan is worse than coronavirus (Banerjee 2020). The need for preparation of any natural disasters has been also emphasized by the highest authority of Bangladesh (Daily Star 2020). It has been stressed to the National Disaster Management Council to take necessary steps for the preparation of disasters and review the progress of disasters related plans at intervals in Bangladesh (ibid). It is also urged by the concerned authorities of Bangladesh to disseminate the guidelines to the people about their dos and don'ts at the time of

disasters. It is also stressed to conduct awareness campaign at personal and organizational levels by integrating the national level (ibid). Indeed the greatest natural resources of a country are its people. Human being is also an asset like other assets. Human resource is being used in terms of money and materials to the development of society. That is why human capital is known as human resource. Human capital can be converted into human resource if it is possible to use them effectively and efficiently. Education is the most important indicator of economic development that can assist to reach the human capital into human resource. The present study seeks to examine the impact of education of the dwellers of Sandwip Island on their awareness of natural disasters.

LITERATURE REVIEW

Ahmed et al. (2016) found that 98.9% of households received early warnings mainly from metrological hazards. It was also identified from the study that the community disaster management committee played a vital role in disseminating early warning.

Alam and Collins (2010) explored the vulnerability to cyclone hazards in the context of prior, during and after the events of cyclones. This study was based on field level qualitative data. Study areas were Chakoria, Kutubdia, Sandwip and Urir Char of Bangladesh. It was revealed from the study that peoples of cyclone hazards areas depend on the mercy of God prior to cyclone by raising their religious activities. It is also revealed from the study that cyclone affected peoples are like to cope with each other's for the survival and to start up normal life again. The study of Islam et al. (2015) conducted about the recovery of peoples after disasters or resiliencies of peoples. The study was done among fourteen unions of the Sandwip island. The study assessed mainly the initiatives which recover the communities of the selected unions of the island. The study was descriptive type based on mean and standard deviation. It was suggested by the study to take many structure and non-structural measures. However, further research was proposed to identify the dynamics of local through field level data for the

better recovery of disasters affected coastal communities of Bangladesh.

A study was conducted among “persons with disabilities” in coastal regions in Bangladesh by Islam et al. (2018). They collected data from three sub districts of Bagerhat district. There was no sampling frame for the study and the study selected 150 respondents by using snowball sampling. A study by Mahmud (2013) investigating the underlying causes of non-responsive attitude of women and children to cyclones early warning signals at Nijhumdwip. Both primary and secondary data were used in the study. The study released that a majority of the respondents were unable to follow and respond to the cyclone early warning signal dissemination but unfortunately they cannot interpret them due to lack of proper knowledge.

Mc Michael (2015) indicates the various climate changes due to human effect. This climate change also affects the human body and causes various effects such as thermal stress, infectious diseases and more.

The objective of the study was to understand (Paul, 2014) why people are non-compliant to the evacuation initiatives during cyclones Sidr and also to do a comparative analysis to find out the major reasons why peoples are not listening to the warning. It was selected 331 households out of three villages which were affected by cyclone Sidr. The study followed the simple random sampling procedure. It was followed descriptive and inferential statistics for the analysis.

The study of Lucia (2019) investigated the level of awareness on disaster preparedness. The location of the study was Mimbalot in Buru-un of the Iligan City of Philippines. It was based on survey data. The study provided informative implications for the residents of the study area such as the readiness of all time and practice of preparedness with a view to handle the situations during the time of emergency.

Rahman (2015) discussed the issue of sea bed community and how they suffer with storm, rising the

sea water and heavy rain in the areas. This paper gives the mitigations process based on the environmental and non-environmental effects. It mentioned why people are forced to migrate from cyclone prone areas. This also gives the detail ideas about the environmental stress and migration task.

Haque (2018) conducted about the assessments of livelihood resilience in relation to cyclones and climate change along the south western coastal belt of Bangladesh. The location of the study was Dacope upazila of Khulna district. The area of study was severely influenced by the cyclone Alia. The data of the study came from field survey which was done with the help of semi structured questionnaire. The number of selected households were 160. Survey was done among four villages of the Dacope upazila. The study revealed that households are helpless prior to and during the time of cyclone. However, it was revealed that households were relied on different aid organizations after the cyclone. The study also explored that the residents of the locations are lacking necessary facilities such as transportation and medical facilities etc. It was emphasized that government and NGOs would assist the suffered peoples satisfactorily. Most recent study of Loknath and Probir (2021) found that the awareness of natural disasters (cyclone) in the state of Odisha, India yet been recognized and many peoples are killed and properties are lost every years. The study emphasized to draw a long term plan to overcome natural disasters like cyclone. This was a descriptive type study and based on secondary information.

A lot of studies have been conducted about the natural calamities of disasters from the different perspectives. Studies (Haque 2018; Sultana and Moniruzzaman 2016) of South Western coastal belts of Bangladesh are comparatively assumed to be progressive than studies of other coastal belts of the country. However, preferences of previous studies (Alam and Collins 2010; Islam et al. 2015; Haque 2018) of Bangladesh were given to vulnerability and resilience of the coastal peoples before, during and post disasters. Differences of previous studies are difficult to decide

because the goals of the past studies are almost similar except locations, samples and analysis procedures which have been conducted from different dimensions. Despite of these, many observations have been obtained about the disaster prone peoples of Bangladesh from the previous studies. Indeed, every year there occurs cyclone in the study areas of researchers and many human lives are lost including properties. Human beings are rational. But the determinants of the awareness of natural disasters among the coastal peoples are not clear from the past studies in Bangladesh. For example, it is reported in one study (Sultana and Moniruzzaman 2016) that a fewer number of respondents opened their awareness of cyclone while the majority expressed their unawareness of the cyclone. But no clear cut relationship is identified from the study to find out the factors which are responsible to create awareness of the peoples. Similarity is also found in Lucia (2019). Charles and Kate (2012) observed the relationship between the indicators of environmental attitudes and awareness in their experiment. Haque (2018) examined the relationship between the respondents' recovery and the measures before and after cyclone within a limited span.

Habiba et al. (2013) and Hafifa (2008) assessed the inclusion of the environmental education in the existing educational syllabus of Bangladesh through primary school to graduate levels. They revealed that the content of disaster management has been included in the syllabus of class V to Graduate levels in Bangladesh. However, no clear-cut impacts are still being found whether the education of the country is able to create awareness of natural disasters among the people. Education changes attitudes, thoughts and judgment power of people. Awareness of the development of living status is also determined by the education. Studies (Hassan and Paul Ratnakar 2012; Poonam 2013) examined the impact of environmental education on the awareness of disaster in India. No such comprehensive study has been done yet to know the impact of education on the awareness of natural disaster in Bangladesh. Compared to the previous studies, the present study seeks to identify the effects

of education on the awareness of natural disasters (Cyclone) and thus, the study can reduce the existing study gap. Needless to say, the awareness of natural disasters is still a major issue and it is being strongly addressed by the top level of governments (Daily Star 2020). Keeping this in mind, the present study has taken initiative to examine the impact of education on the awareness of disasters in the dwellers of Sandwip Island in Bangladesh. It is expected that the findings of the study will be helpful for the persons, officials and agencies to improve the human resources, public health and environment. It can also assist to identify the actual status of education and other factors' to create awareness of natural disasters.

METHODOLOGY

A brief overview of the island Sandwip

Sandwip was affected by devastating cyclones and tornados in 1825, 1876, 1895 and 1991. On 29th April 1991, the most damaging storm affected the island. Every year Sandwip experiences different levels of natural calamities. For this reason, this study has been performed in this area. It is situated at the north east side of the Bay of Bengal which is not so far from the port city of Chittagong. It is bounded by the Companiganj on the north, Bay of Bengal on the south, Sitakunda and Mirsharai and Sandwip channel on the east while Noakhali Sadar, Hatiya and Meghna estuary on the west (banglapedia.org). This island has a population of 2,92,773 comprising 1,43,277 males and 1,49,496 females (BBS 2011).

Study site

It has been selected Magdhara union among 14 unions of the Sandwip upazila. It is the biggest union of the island and it stands nearest to the bank of the sea. For this reason, this union has been selected purposively to perform the present study. The area of the union is 156 sq.km and the rate of literacy of this union is 36.49 % (ibid).

Sample size and data collection

The data of the study came from primary and secondary sources. The primary data was collected through field survey. The total population of the union is 37,988 while male and female populations are 18,852 and 19,136 respectively (BBS 2011). Out of these populations, number of selected respondents were 279 for the study. The selection of the respondents were followed convenient sampling procedure. The collection of data have been conducted through face to face interview with pretested questionnaires. The period of survey was 2019.

Analyses techniques

The data of the study were compiled and tabulated with the help of scientific devices such as calculators and computers. The survey questionnaire was comprised of qualitative data. The qualitative data has been transformed into quantitative data by applying different scores. The overall study has been completed through frequency, percentage and regression analyses (SPSS, version 17) to attain the objective of the study.

Conceptual framework

Islam et al. (2015) organized their research work by considering four indicators, namely demography and health, living conditions, economic status and education and awareness including twelve variables for the resilience study. The analytical tools of the study was descriptive statistics. Results of their study have been interpreted on the basis of lower, medium and higher values of mean and standard deviation. Sultana and Moniruzzaman (2016) examined their study by taking purposively selected factors such as age, gender, occupation, education, religion and respondents' knowledge of awareness of natural disasters. The method of analysis was frequency and percentage. Hafizia and Saadi (2015) considered the earthquake, types of duties and responsibilities of the Dhaka city dwellers during earthquake, fire and water logging. The method of analysis was descriptive

statistics in terms of frequency and percentage. Charles and Kate (2012) have conducted their study with the help of demographic factors and environmental issues. The major demographic factors were age, gender, education, occupation and income. The environmental issues were importance, choice, action, encounter, search, concern and politics. T-values have been computed to identify the differences among the factors independently of their study. A multiple correlation analysis has been done also to examine the relationship among the variables. Haque (2018) collected both quantitative and qualitative data. Selected variables were divided into socioeconomic, demographic and other characteristics. The socioeconomic variables were income, occupation and education while age, gender, marital status etc. were included in the demographic variables. The other households' characteristics were housing condition and drinking water source etc. The study has been conducted with the help of frequency, percentage, chi square test and a linear regression analysis has been done in fewer number of cases.

Empirical Model

It can be concluded from the above discussions that various procedures have been followed by the different authors to run the disasters related studies. The one important procedure may be the functional type analysis through regression which can usually identify the actual impact of independent variable on dependent variable. The input output model has been applied in this study (Haq 2011; Yasmin et al. 2006; Khan et al. 2006). It is generally interpreted as $Y=F(X)$ where Y is the dependent variable and X is the independent variable. This functional interpretation is not limited to one independent variable rather it can be extended to a large number of independent variables according to the necessity of the study as it is seen in Yasmin et al. (2006), Khan et al. (2006), Charles and Kate (2012), Hassan and Paul Ratnakar (2012) and Haque (2018). On the basis of the model, it was possible to conduct the study by interpreting the equation as awareness of disaster(Y) = f(education). But there are many other factors which may have also

effect on the awareness of disaster as it is evident from different relevant previous studies. Keeping this in mind, fourteen factors have been retained for a multi variate analysis to run the study out of twenty six factors from the survey module of the study which are

decided on the basis of logical expressions and experiences of relevant studies (Haq 2011; Yasmin et al.2006). Selection backgrounds, symbols and expected signs of the variables are presented in Table 1.

Table 1: Backgrounds, Operational definitions and expected signs of selected variables

Variables	Descriptions	Expected signs
Age(X_1)	Age of respondents is an important factor for the determination of awareness of natural disaster. It is expected that the older people are comparatively aware of natural disaster than the comparatively younger peoples. However, the young or middle aged peoples may be also aware of disaster. So a positive sign is expected between the age and awareness of natural disaster and vice versa.	Positive
Family types(X_2)	Human beings are rational. So regarding out any types of family, it is expected that any types of families are perceived positively to the awareness of natural disasters. A positive sign is expected and vice versa.	Positive
Types of natural disasters(X_3)	There are different types of natural disasters. Different disasters have different impacts on human beings. Peoples are necessary to conscious about the impacts of those types of natural disasters and their effects. In this context, a positive sign is expected between the types and awareness of natural disasters and vice versa.	Positive
Medias(X_4)	Medias are very important factors in order to disseminate the news of natural disasters among the peoples. So peoples are prepared for natural disasters by receiving news from the media. Thus a positive relation is expected from this variable. However, medias role may not be effective. Therefore, an inverse relationship between media and awareness of disasters is also expected.	Positive
Training(X_5)	Due to lack of volunteers or rescuers at the time of disasters, there is a chance of severe loss of human lives and property loss. Therefore, training programs are arranged by the different organizations for the morale development of the peoples of disaster prone areas. Thus training has positive influence on people's awareness on disasters Alternately, the impact of training may be inverse on disaster's awareness.	Positive
Measures(X_6)	Coastal areas are very often affected by natural disasters. So the peoples of coastal areas should sincere with maintenance of houses, medications, storing foods, fuels etc. to survive at the time of disasters. Therefore a positive sign is assumed between regular measures and awareness of disasters and also vice versa.	Positive
Recovery time(X_7)	Many damages of properties and wealth are happened during the time of natural disasters. These losses can recover earlier or take a longer time. A positive relationship is associated between recovery time and awareness and also vice versa.	Positive
Educational status(X_8)	Education increases knowledge and awareness of peoples. It is assumed generally that with the increases of education of peoples, peoples will able to know more about the disasters. It will increase awareness of disasters. Thus a direct relationship is expected between education and awareness of disasters.	Positive

Safe drinking water(X_9)	Pure drinking water saves peoples from water borne diseases. This awareness build up is necessary during the time of natural disasters. So this item has positive influence on awareness of disasters. But save pure drinking water in the rural areas may not be possible always. Thus an inverse relationship can be expected also.	Positive
Shelter(X_{10})	Shelter is very important when disaster is occurred. So peoples must be aware of the place of shelters. But due to any unavoidable circumstances such as insecurity of properties, long distance and weak transportation etc. Shelter cannot create awareness and thus, an opposite relationship is also expected between shelter and awareness.	Positive
Local warning systems(X_{11})	Due to heavy rainfalls, strong windfalls etc. media like TV, radios etc. cannot work effectively. Under these circumstances, local warning systems play effective roles prior to disaster like cyclone. A positive association is expected between the variable with the awareness. However, it may not play effective role always. So the association between the two variables is expected to be inverse also.	Positive
Marital status(X_{12})	A married person is expected to be conscious about natural disaster. But persons who are not married maybe not unaware. So there is a positive relation between the marital status and awareness and vice versa.	Positive
Family loss(X_{13})	Many peoples died during the disasters. It is necessary to be aware to save lives of peoples from the disasters. If family loss increases, it means that peoples are not aware and vice versa. Thus an inverse relationship is expected.	Negative
Awareness of disaster (Y)	Peoples are motivated through awareness creation programs of natural disasters. Massive programs are being taken by the different ways to build up the awareness of peoples in the natural disaster affected areas in Bangladesh. Thus, it is important to note to identify the determinants of awareness of peoples in the coastal areas. Therefore, this variable is considered as dependent variable in the study. The study island is a cyclone prone area. So awareness of natural disaster means awareness of cyclone in this study.	Dependent variable

The appearance of multicollinearity problems is very common to any functional analysis and thus, different dimensions are seen among the researchers to conduct their studies. For example, Khan et al. (2006) conducted the multiple correlation matrix prior to multivariate analysis while it was not seen in others (Yasmin et al.2006; Jamila et al.2006; Haque 2018). The procedure of the present study is similar to (Yasmin et al.2006; Jamila et al.2006) and examined the semi logarithmic type multivariate regression analysis to avoid any disparities of the variables (Haq 2011). Therefore the proposed function of the analysis is as follows: $\text{Ln}Y = F(\text{Ln}X_1, \text{Ln}X_2, \text{Ln}X_3, \text{Ln}X_4, \text{Ln}X_5, \text{Ln}X_6, \text{Ln}X_7, \text{Ln}X_8, X_9, X_{10}, X_{11}, \text{Ln}X_{12}, X_{13})$.

Different ranks have been imputed to convert the qualitative data into quantitative ones since most of the data are qualitative in this study. It has been examined relevant works prior to provide ranks of the variables. The study of Lindy et al. (2000) considered strong agree or agree "2" and disagree or strong disagree "0" while Hassan and Paul Ratnakar (2012) scored 5,4,3,2 and 1 for strong agree, agree, neutral, disagree and strongly disagree in their study. It is seen in Jamila et al. (2006) that female=1 and male=0 while it is stated male=9 and female=1 in Yasmin et al. (2006) as per the ratio between male and female. In case of education level, it is seen that illiterate, class I-V, class VI-IX and SSC+ have been scored 1, 2, 3 and 4

respectively in the study of Yasmin et al.(2006). It has been found in Islam et al. (2015) that demographic and health 5, living conditions 4, economic status 3 and education 2. It is seen in another study (Charles and Kate, 2012) that the most important issue is 1 while least important issue is 7 considered to indicate the importance of climate change. In case of environmental information, the same study considered 1=daily, 2=weekly, 3=regularly, 4=yearly

and 5=never. The knowledge of environmental issues, it has been scored 1=excellent, 2=very good, 3=average, 4=below average and 5= poor average (ibid). It is revealed from the above studies that there is no consistent procedures followed to transform the qualitative items into quantitative ones. The present study follows the conversion procedures which is either similar or dissimilar to the past ones and it is visible in Table 2.

Table 2: Numerical values of variables

Variables	Describe	Rank	Measurement Criteria	Basis
X ₁	Age	1 2 3 4	Below 20 21-25 26-30 >31	Age criteria
X ₂	Family type	3 2 1	Nuclear Joint Extended	Number of respondents
X ₃	Experiences of natural disasters	4 3 2 1	Cyclone Earthquake Lightening Landslide	Number of respondents
X ₄	Medias	1 2 3 4	Television Radio Advertisement others	Purposively
X ₅	Training	1 2 3 4	No training Red crescent Govt. institute Others	Purposively
X ₆	Measures against natural disaster	6 5 4 3 2 1	Housing site selection & maintenance carefully First aid medication Stocks of food Stocks of fuel Storing survival tools others	Consciousness of respondents
X ₇	Recovery time	4 3 2 1	One week 1-3 months 6-12 months >1 year	comparatively early recovery
X ₈	Educational status	1 2 1 2	Illiterate- stay safe shelter Illiterate -stay home Literate - stay at home Literate -stay safe shelter	Purposively
X ₉	Safe drinking water	1 0	Yes No	Consciousness of respondents

X ₁₀	Shelters	1 0	School Others	Priority of number of respondents
X ₁₁	Local warning systems	1 0	Loudspeakers Others	Number of respondents
X ₁₂	Marital status	3 2 1	Married Widowed Unmarried	Number of respondents
X ₁₃	Family loss	1 0	Yes No	Significance of human loss
Y	Awareness	3 2 1	Full aware Partial aware Unaware	Priority of awareness

Data reliability test is usually suggested for those studies which are mainly based on qualitative data and completely relevant to the Likert scale (Haque 2018). Thus, it is supported or not supported in all relevant literatures (Hassan and Paul Ratnakar 2012; Yasmin et al. 2006). Despite, an attempt was made to check data reliability in the study and Alpha Cronbach is found 0.614 which lies 0 to 1 and assumed to be reliable (Shamima 2016).

RESULTS AND DISCUSSION

Awareness of the respondents is the dependent variable of the study. It is seen (Table 1-A) that 45.52% of the respondents don't have any awareness for upcoming disasters (cyclones) and 46.9% of the respondents are partially concerned of disasters. It is found (Table 1-A) that 7.52% respondents are fully aware of the disasters. The study of Sultana and Moniruzzaman (2016) observed that 32.8% were aware of natural disasters while 67.2% did not aware in that case.

The results of multiple regression analysis indicate that the adjusted R^2 is 0.720 which means that 72.0% of total variations in awareness of disaster have been explained by the independent variables included in the model. The F value is 55.857 and it is significant at 1% level of significance. The 1% level of significance of F value indicates the good fit of the model. The result is similar to (Yasmin et al. 2006; Hasan and Ratnakar 2012).

The study illustrates that the number of illiterate respondents were 52.1% while 39.7% and 6.8% of people had completed primary and secondary levels respectively and 1.44% of the people completed HSC equivalents (Table 2-A). It is seen (Haque 2018) that the number of illiterate respondents were 25% while 41.3%, 30% and 3.8% respondents had primary, secondary and above secondary level degree. Another study (Sultana and Moniruzzaman 2016) found that people cannot read or write 23.9% while primary, secondary, higher secondary and graduate were 32.9%, 18.4%, 13.4% and 11.4% respondents respectively. It is seen that primary, SSC and above SSC qualified respondents were 12.9%, 27.3% and 58.8% respectively (Charles and Kate, 2012).

It is found in the present study (Table 3-A) that education of the respondents has positive and significant impact on the awareness of disasters (cyclones). It is seen that majority educated peoples prefer to go safe place than the illiterate peoples. It is also seen (Table 2-A) that illiterate peoples prefer to stay home than to go safe places. It can be inferred that the education of Bangladesh is productive and it increases the understanding abilities and capacities of the peoples of natural disasters. It is also plausible since the environment related curriculum is included in the existing educational policy of Bangladesh (Habiba et al. 2013) which might improve the knowledge of disasters of the peoples. Therefore, the coefficient of education variable is significant and positive. Variables like age (X_1), measures (X_6),

recovery (X_7), safe drinking water (X_9), marital status (X_{12}) and family loss (X_{13}) are found positive also other than education of the respondents (Table 3-A). The positive values of beta coefficients of the variables including education (X_8) indicate positive relationships exist with the dependent variable. Negative values of the beta coefficients such as family type (X_2), disaster type (X_3), Medias (X_4), training (X_5), shelters (X_{10}) and local warning systems (X_{11}) indicate inverse associations with the awareness of disasters (Table 3-A).

CONCLUSION AND RECOMMENDATIONS

The purpose of the study was to identify the relationship between the awareness of disaster as dependent variable and education with twelve other independent variables or predictors. The assumptions were that awareness of disasters is positively influenced by the selected independent variables. Both positive and negative relationship have been found between the awareness of disasters and independent predictors. The predictors like age (X_1), preventive measures (X_6), recovery time (X_7), educational status (X_8), safe drinking water (X_9), marital status (X_{12}) and family loss (X_{13}) have been played positive role on the awareness of disaster (Y). Except those, types of families (X_2), types of natural disasters (X_3), medias (X_4), training (X_5), shelters (X_{10}) and local warning system (X_{11}) have no direct association with the awareness of disasters.

The previous studies (Islam et al. 2015; Haque 2018) found that average educational status of the respondents is moderate or weak. Compare to the pasts, the present study reveals that the variable education has positive impact on the awareness of disasters (cyclones). Among others, the variable local warning system of cyclone was found highly responsive to the awareness of cyclone among the respondents of the past studies though no functional relationship was examined in those studies (Alam and Collins 2010; Islam et al. 2015; Haque 2018). The present study also observed that local warning system has significant but negative impact on awareness. Hence

the present study can be comparable to the previous studies.

Variables which are not directly associated with the awareness of disasters (cyclones) cannot be underestimated. It cannot mean that they have not any impact on awareness. It might be fact that they are influenced by other factors which are excluded from the study (Yasmin et al. 2006). For example, it is evident from the field observation that most of the respondents' have minimum five years' experience of cyclone till the period of study which helped them to prepare of such natural disasters. Another important predictor is shelter (X_{10}) which is found to be negative but the magnitude is significant. The shelter places which are reported by the respondents are known to the respondents. But they are less aware due to improper health, hygiene and safety conditions in the schools and local community centers etc. Moreover, respondents do not prefer to go to the shelter places because of the insecurity of their houses, wealth and domestic animals. Therefore, peoples of such areas are forced to go shelter places by the intervention of different govt. and non govt. agencies when the cyclone about to start severely. Overall, fewer following things may be recommended alongside education.

Education has significant contribution on the awareness of the respondents. It should be taken care by the NGOs and other development agencies so that no one can drop out from the educational institutions. It may think to introduce the present environmental education as an independent subject in the existence syllabus from the pre-primary school to twelve classes like many other countries through necessary experiments (Hassan and Paul Ratnakar 2012; Poonam 2013). Training is an important tool for the human resource development. Training programs should be evaluated properly by the agencies which arrange trainings to give ideas of natural disasters to the island dwellers. Training is also a costly program. The concerned authorities should identify the needs of the training, process of training, levels of trainees including trainers and monitor the outcomes of the

training as per the guide lines of human resource management (HRM) properly. There are many human resource experts in Bangladesh and they can be associated with these training programs.

Health, hygiene and safety is another important tool for comfortable life. Shelters of the cyclone prone areas are not well structured. Specially, sanitation systems of the shelters are not neat and clean as per the guidelines of the HRM. Sanitations become worsens and unhygienic when peoples start to gather these shelters during the time of cyclone. It creates diseases also. This is another negative attitude of peoples to prefer to go shelters at the time of cyclone. So the relevant authorities should take care of health, hygiene and sanitation management of the shelters of cyclone.

Safe pure drinking water is necessary to save from lives from water borne disease. The preservation of pure water for the days of disasters are found available to majority peoples and the magnitude of this variable is significant and positive in the study. Different govt. and non govt. agencies should take initiatives so all peoples of these areas can keep pure water to use at the time of disasters.

The study island is the oldest cyclone prone area of Bangladesh. The medication system of the island cannot be claimed well structured. The island has one upazila health complex and fewer number of union health sub centers. Island peoples need to go hospitals of Chittagong due to insufficient facilities of treatment of the island during and post disaster. It takes time to reach the Port City by crossing over the sea from the island. This becomes very difficult after the cyclone when transportation systems are also disrupted. The existing health treatment centers of the island should be modernized and extended. Similar expectations were also reported in the past studies (Islam et al. 2015). The concern authorities should take note of this.

It cannot tell that the above comments are the best ones. These recommendations based on outcomes of the analysis from the fewer number of respondents

and logical thoughts which have been assumed to be important from the observations in the locals during the survey. Indeed, the analysis may be predictions. However, predictions may be the gateway to make future plans. Natural disasters were in the past and it still exists (YouTube 2021) and will be alive in the earth. Therefore, more in depth analysis is expected by the authors to identify the awareness of disasters among the island dwellers.

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Appendix - A

Table 1-A Distribution of respondents according to their awareness

Nature of preparation	Frequency (%)
Unaware	127(45.52)
Partial aware	131(46.96)
Complete aware	21(7.52)
Total	279(100)

Source: Field survey, 2019

Table 2-A Actions taken during a natural calamities based on educational status

Particulars	Safe shelter (%)	Stay at home (%)	Total (%)
Illiterate	92(32.97)	53(19.0%)	145(51.97)
Primary/equivalent	87(31.19)	24(8.60)	111(39.78)
SSC/equivalent	16(5.73)	3(1.07)	19(6.81)
HSC/equivalent	4(1.44)	0(0)	4(1.44)
Graduate ⁺	0(0)	0(0)	0(0)
Total	199(71.33)	80(28.67%)	279(100)

Source: Field survey, 2019

Table 3-A Results of Multiple Regression Analysis

Model	Co-efficient	Std.Error	T	Sig.
Constant	0.231	0.204	1.132	0.259
LnAge(X ₁)	0.160*	0.115	1.575	0.117
LnFamily type(X ₂)	-0.037	0.097	-.615	0.539
LnDisaster type(X ₃)	-0.738***	0.080	-7.874	0.000
LnMedia(X ₄)	-0.248	0.147	-1.202	0.230
LnTraining(X ₅)	-0.417***	0.132	-4.653	0.000
LnMeasures(X ₆)	0.925***	0.108	5.029	0.000
LnRecovery time(X ₇)	0.199*	0.108	1.549	0.123
LnEducation(X ₈)	0.353***	0.078	5.125	0.000
Safe drinking water(X ₉)	0.219**	0.086	2.017	0.045
Shelter(X ₁₀)	-0.137**	0.062	-1.817	0.070
Local warning System(X ₁₁)	-0.274***	0.098	-2.961	0.003
LnMarital status (X ₁₂)	0.141**	0.132	1.997	0.047
Family loss (X ₁₃)	0.019	0.063	0.314	0.754
R ²	0.733	0.20490		0.000
AR ²	0.720			
F-value	55.857			

Dependent variable: Ln Awareness of disaster;

***, ** & * indicate 1%, 5% & 10% level of significance

Appendix - B**Table 1-B Age of the respondents**

Age (Years)	Frequency (%)
Below 20	13(4.12)
21-25	23(8.78)
26-30	41(14.40)
>30	202(72.70)
Total	279(100)

Source: Field survey 2019

Table 2-B Family type of the respondents

Type of family	Frequency (%)
Nuclear	151(54.1)
Joint	122(43.7)
Extended	6(2.1)
Total	279(100)

Source: Field survey 2019

Table 3-B Distribution of types of natural disasters experienced by respondents

Types	Frequency (%)
Cyclone	213(76.70)
Earthquake	31(10.90)
Lightning	13(4.70)
Landslide	22(7.70)
Total	279(100)

Source: Field survey 2019

Table 4-B Medias TypesFrequency (%)

Types	Frequency (%)
Television	109(39)
Radio	64(23)
Outdoor advertisement	62(22)
Others	44(16)
Total	279(100)

Source: Field survey, 2019

Table 5-B Training of respondents

Particulars	Frequency (%)
No training	17(5.92)
Red Crescent	220(78.87)
NGOs	13(4.80)
Govt. institutes	29(10.40)
Total	279(100)

Source: Field survey 2019

Table 6-B Measures taken by the respondents against natural disasters

Measures	Frequency (%)
Careful about maintenance of residence	107(38.4)
Medication/first aid kits stored at home	20(7.2)
Stocks of food	79(28.3)
Stocks of fuel	17(6.0)
Storing survival tools	46(46.0)
Others	10(10.0)
Total	279(100)

Source: Field survey, 2019

Table 7-B Distribution of respondents with the time for recovery

Duration	Frequency (%)
One week	142(50.9)
1-3 months	89(31.9)
6-12 months	38(13.6)
>1 year	10(3.6)
Total	279(100)

Source:Field survey, 2019

Table 8-B Arrangement of drinking water

Particulars	Frequency (%)
Yes	171(61.30)
No	108(38.70)
Total	279(100)

Source: Field survey, 2019

Table 9-B Respondents preferences of places of shelters

Particulars	Frequency (%)
School	189(67.83)
Government office premises	35(12.57)
Relatives home	23(8.04)
Mosque	15(5.53)
Others	17(6.03)
Total	279(100)

Source: Field survey, 2019

Table 10-B Respondents responses about local warning systems

Particulars	Frequency (%)
Bell/ alarm/ siren	40(14.30)
Loudspeakers	235(84.23)
Others	4(1.44)
Total	279(100)

Source: Field survey, 2019

Table 11-B Marital status of the respondents

Marital status	Frequency (%)
Unmarried	9(3.3)
Widowed	11(3.9)
Married	259(92.8)
Total	279(100)

Source: Field survey, 2019

Table 12-B Loss of family members among the respondents by the disasters

Particulars	Frequency (%)
Yes	47(16.8)
No	232(83.2)
Total	279(100)

Source: Field survey, 2019