

Natural Hazards and Related Contents in Curriculum of Geography in Pakistan

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ABSTRACT

Natural hazards in Pakistan are often and have severe intensity. Lack of basic knowledge about it at schools and colleges in the country, enhances the human and capital losses. The present study aims to underline the occurrence of natural hazards and analyze the contents related to natural hazards in Higher Secondary School (HSS) curriculum of Geography in Pakistan. The curriculum contents were analyzed with reference to natural hazards like floods, earthquakes, storms, avalanches, landslides, extreme temperature events and droughts. It is found that no significant contents about natural hazards are included in the curriculum of grade XI and grade XII.

Keywords: Pakistan, natural hazards, curriculum of geography

INTRODUCTION

The rapid growing global population (World Urbanization Prospects, 2010) not only has severe implications for better health facilities, urbanization, energy crisis, employment opportunities, food supply and sustainable environment, but also has consequences towards degradation of environment and is causing to accelerate the major anthropogenic sources of emission of CO₂ (Grimmond, 2007; Svirejeva-Hopkins et al., 2004). The increasing anthropogenic activities have made this world of 7 billion more sensitive to live because of increasing intensity of natural hazards. During last 100 years (1906 – 2005) global mean surface temperatures rose by 0.74°C ± 0.18°C and the rate of warming over the last 50 years (1956 – 2005) is almost double that over the last 100 years (Trenberth et al., 2007). Recent climate changes and climate variations are beginning to have effects on many natural and human systems such as enhanced risk of melting of glaciers, reduction in length of growing seasons because of prevailing warmer and drier conditions, decrease in crop yields, loss of coastal wetlands and mangroves and increasing damage caused by coastal flooding because of rising sea-levels, scarcity of availability of freshwater, flooding from rivers, impinge on the sustainable development because of pressures of climate change on natural resources and risk of hunger (Adger et al., 2007). Quite often, such changes at global and regional scales shape into mega disasters (as recent floods in 2010 and 2011 in Thailand, Pakistan, Colombia and heavy storms in USA) and cause human casualties and obliteration of infrastructure.

The developing countries like Pakistan are highly vulnerable to such calamities because of less adaptation to face the risks associated to natural disasters. Pakistan has a population of 184.7 million and having all kind of topographical features, the country is rich in natural resources and is blessed with four seasons. Changes in global and regional climates are playing an important role in creating climate related hazards in Pakistan as floods, cyclones and severe droughts. Moreover, two-third of Pakistan lies on fault lines that have been causing the deadliest earthquakes (as in 1935 in Quetta and in 2005 in Azad Jammu Kashmir). The big cities like Karachi, Peshawar, Abbottabad, Quetta, Gilgit, Chitral and

Islamabad are also located on the fault line zones and are highly vulnerable to any seismic activity in future (The Nation, 2008).

Academic curriculum of any country plays a pivotal role in socio-economical and scientific development of that country. Many countries of the world have emphasized the teaching of Geography as a compulsory subject at Secondary to Higher Secondary School (HSS) level. Some countries like India have introduced Natural Hazards and Disaster Management as a separate subject at HSS level (Central Board of Secondary Education, India, 2003; 2005; 2006) and in some countries; the contents of Natural hazards/disasters are included in textbooks of Geography. The sole objective of all these countries is to educate the young generations about natural hazards, its causes, effects and strategies to reduce its effects. Unfortunately, in Pakistan, the literacyⁱ rate is around 50 per cent only and Geography as a subject is not compulsory part of education system. It is adopted as an optional subject at Secondary and HSSⁱⁱ level. According to an estimate only 2 to 5 percent of students opt Geography as a subject at intermediate level and in colleges located in rural areas, this percentage is even less.

The objective of the present study is to analyze the contents related to natural hazards and disaster management in the curriculum of Geography of HSS. The literature review suggests that natural hazards are mainly classified into floods, earthquakes, storms, avalanches, landslides, extreme temperature events and droughts, which we include in this work. The curriculum document of HSS Geography was obtained and analyzed with reference to these categories.

In second part of the article, details of major natural hazards and resulted disaster's effects are given. Part three is describing the analysis of natural hazard's related contents in HSS Geography curriculum and in last section; discussion and conclusion of the study are given.

Natural Hazards in Pakistan

Pakistan is susceptible to varied natural havocs, the reason being climate of the country and its location in a region that is much vulnerable to these calamities. Diverse range of terrain of Pakistan, its unstable geo-physical characteristics, and global warming along with lack of disaster-control infrastructure, growing number of residents on flood plains, absence of disasters related knowledge and preparedness are the root causes of amplified calamities in Pakistan. Floods, earthquakes, cyclones, droughts and landslides of unpredictable intensity and frequency, causing substantial life and property fatalities, are not alien phenomena for country. Till present, Pakistan has faced floods almost every year because, in summer, torrential monsoon rains and melting snow on mountains in North of Pakistan make the rivers distend their banks while at the same time country recurrently has experienced earthquakes in varying intensity as well. In addition, ferocious cyclones are not vey uncommon in the coastal areas of Pakistan.

The unimpeded and vicious water flow from denuded hill sides, because of deforestation, exacerbates the intensity of avalanche in lower Himalayas. In 1999-2000, drought in Balochistan that lasted over 10 months, affected about 2.2 million people and led 143 deaths, mostly because of dehydration. Millions of livestock perished over this period. In 2005, a 7.6 Richter scale earthquake in Northern areas of the country caused 73,338 deaths and massive property losses while in early July 2007, cyclone Yemen that triggered flash floods caused 730 deaths and decay of two million animals. It left 350,000 people displaced and 1.5 million

ⁱ In Pakistan, the person who can read and write is considered as literate.

ⁱⁱ Intermediate/Higher secondary school level studies in Pakistan start from 1st year of college education at an average age of 15 to 17 years.

affected. In 2010, the monsoon tearing through the prodigious mountainous range in Khyber-Pukhtunkhwa caused the worst devastating and disastrous floods in the history of Pakistan. Unprecedented magnitude of the catastrophe caused more than 20 million people displaced and left another 1,985 dead. Heavy rains made Indus River 15 miles wide, some 25 times broader than normal. About 1.7 million acres of farmland were devastated in the flood-ravaged areas of Sindh and Punjab provinces. The people who could manage to escape from the deadly jaws of raged waters were crammed either in temporary shelters or in stuffed and swarming government buildings (EM-DAT, 2012). The total number of affected people exceeded the combined total of individuals affected by the 2004 Indian Ocean tsunami, the 2005 Kashmir earthquake and the 2010 Haiti earthquake (Pakistan Floods 2010: The DEC Real-Time Evaluation Report).

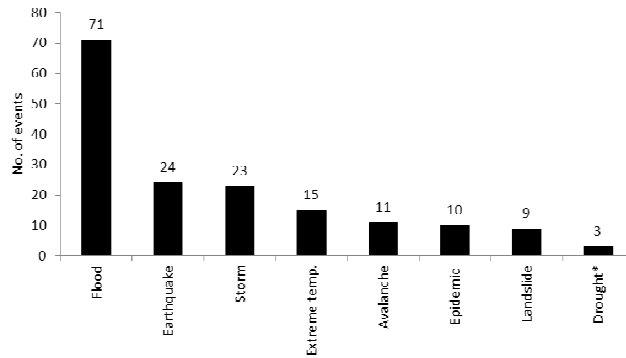


Figure 1: Number of natural disaster events in Pakistan since 1900. Data source: EM-DAT: The OFDA/CRED International Disaster Data base and United Nation Office for the Coordination of Humanitarian Affairs (OCHA) [*except data of drought].

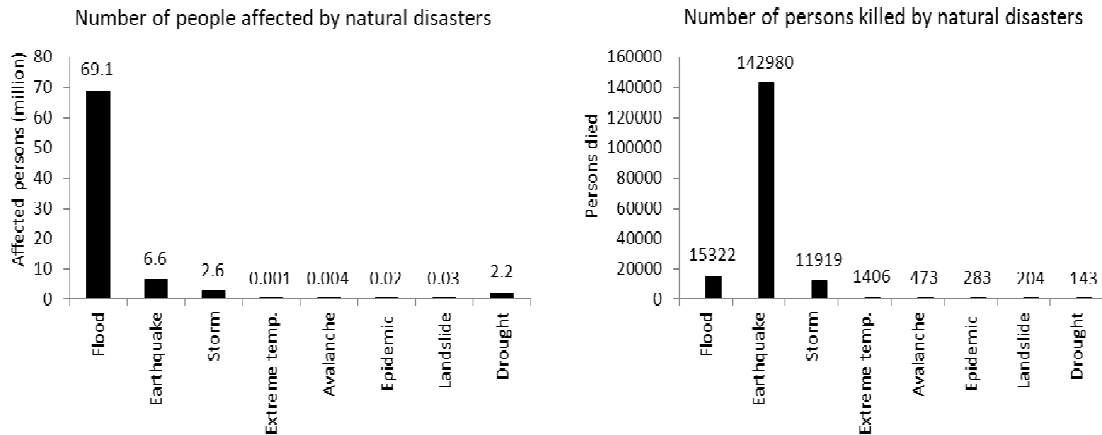


Figure 2: Number of people affected (left panel) and number of persons killed by natural disasters in Pakistan since 1900. Data source: EM-DAT: The OFDA/CRED International Disaster Data base and United Nation Office for the Coordination of Humanitarian Affairs (OCHA).

Figure 1 shows that the frequency of floods in Pakistan is the highest followed by the earthquakes, cyclones and land movement. The most awful aspect of these tragedies in a developing country like Pakistan has always been the derisory evacuation notice, destructions of infrastructure needed by relief agencies, and unavailability of transportation, which play their role in worsening the situation by making evacuation of affected masses relatively

complicated and thus leaving deep scars on communities. As a result, millions of people have to endure traumatic experiences in face of loss of their abodes, roads, bridges, crops, livestock and source of livelihood. Those, who succeed in making out of death, are forced by circumstances to live with epidemics without access to sufficient food, water, and medicine supply. According to the available data, in total the natural disasters caused 172,730 deaths in Pakistan since 1900. Figure 2 highlights the affected people and death casualties by the natural disasters. It shows that the floods have affected about 69.1 millions of people followed by earthquakes and storms by 6.6 and 2.6 million, respectively. While, the death casualties by earthquakes are the highest than floods and storms.

Keeping in view the aspects of natural hazards, now arises the question how can we slow down, and ultimately overturn the tendency of mounting likely debacles and potential probability of hazards worldwide and specifically in case of Pakistan? Among other possible solutions that include development of satellite-activated early warning systems to elevated ground, Pakistan needs an amalgam of technology, preparedness and proper disaster planning to deal with any future natural disaster (Memon, 2011). Generating responsiveness and awareness in common masses about the natural calamities, and training on how to deal with catastrophes is like lessening the misery, vulnerability and suffering of victims. Curriculum of any country is an important vehicle that can best serve in this regard.

Natural Hazards' Related Contents in HSS Curriculum

National Education Policy argues that Pakistan has gone through serious emergency conditions in current years causing human and infrastructure losses on a large scale, the most significant being the earthquake of October 2005. In view of this fact, one of the suggested actions in the policy was that "curriculum, especially of Social Studies, Geography, Languages, and Literacy shall include themes on emergencies, natural disasters and trauma management based on latest international best practices and shall also include information about response to an emergency or disaster" (Government of Pakistan, 2009a, p. 40). For the implementation of the policy action, Curriculum Wing of Ministry of Education, Government of Pakistan provides the services for the preparation of Schemes of Studies (from Class I to class XII), development of curricula, review and approval in consultation through representatives of provincial departments of education and Curriculum Research and Development Centers (Government of Pakistan, 2009b).

Curriculum revision has not been a practice undertaken on regular intervals in Pakistan (Waheed, 2011). In 2005 – 2006, secondary and higher secondary school curriculum of all classes and subjects went through a widespread improvement. Thus, "the Curriculum Wing reviewed the scheme of studies, followed by the revision of curricula for 25 core subjects (from classes I to XII), which was notified in year 2006" (Jamil, 2009, p. 4). Although it has developed and finalized the curriculum of Geography for grade VI to VIII ([without having any contents about natural hazards](#)), yet it requires to revise the curriculum in order to include natural hazards contents for HSS Geography curriculum which was developed eleven years ago (Punjab Textbook Board, 2011a; 2011b).

The curriculum content of grade XIⁱⁱⁱ 'Physical Geography' consists of 9 chapters addressing issues regarding : (1) Geography: Definition, branches, scope and importance; (2) Physical geography and its components; (3) Classification of Rocks; (4) Major Landforms; (5) Weathering and its types; (6) Agents of weathering and denudation; (7) Ocean and their Movement; (8) The atmosphere; and (9) Physical environment and Man. The contents of these chapters only contain the basic knowledge of Geography but the occurrences and events

ⁱⁱⁱ The average age of the students at Grade XI is normally from 15 to 16 years.

of natural hazards, their far reaching socio-economic effects on human life and subsequently the sympathy, resources and efforts required for the rehabilitation of the affected people are not addressed anywhere in the curriculum. The basic knowledge on the concepts such as volcanic rocks, internal and external forces on the earth, structure of cyclones, action of air and running water, sand storm, earthquakes, hot local winds and monsoons are just introduced in the curriculum but the contents related to the destruction of human population, physical and natural resources and infrastructure caused by them are not even introduced. Although normal effects of some of the natural phenomena on human life are described in the document but the severe damages to man are not presented. Surprisingly, there have been 69.1 million people affected by the flood and 142980 persons killed by the earthquake in Pakistan since 1900, such natural disasters are not included in the curriculum of HSS Geography. Although, the floods (71 times), earthquakes (24 times) and cyclones (23 times) are the most occurring natural disaster since 1900 in the history of Pakistan ((EM-DAT, 2012), the knowledge of causes, effects and strategies to reduce its effects are not being taught to young generation because the present curriculum of geography lacks such contents.

Similarly, even more serious picture is portrayed in the case of grade XII^{iv}, HSS 'Regional Geography' curriculum. It is comprised of 16 chapters including (1) World as general; (2) Continents; (3) Pakistan – location, resources and trade; Geography of (4) China; (5) Japan; (6) Saudi Arabia; (7) Geography of continent Europe; (8) United Kingdom; (9) Geography of continent North America; (10) Geography of United States of America; (11) Geography of continent South America; (12) Geography of Brazil; (13) Geography of continent Africa; (14) Geography of Sudan; (15) Geography of continent Australia; and (16) Geography of continent Antarctica are introduced in the curriculum. All these regions of the world are affected by some type of natural disasters. Pakistan is often hit by earthquakes, floods, storms and landslides. China is prone to floods; Japan faces earthquakes and cyclones; Saudi Arabia often suffers from droughts and sand storms; Europe is hit by extreme weather events (as heavy snowfall in winter and heat waves in summer); North and South America including USA and Brazil by droughts, floods and cyclones; and continent Africa including North and South Sudan by water scarcity, droughts and diseases. Unfortunately, the curriculum of Geography of grade XII does not provide any outline or description of any kind of natural hazards which happen in different parts of the world generally, and in above mentioned regions of the world, especially.

Keeping in view the content analysis, the revision of Geography curriculum is vital for the HSS students because at this age group, the students are more energetic, enthusiastic, keen to learn and they are ready to join the professional education soon after. At this age, human values of welfare, sympathy and support to natural disaster affected people can be inculcated through attaining the affective and desirable objectives of Geography curriculum. It is also in national interest to update the curriculum in order to educate young generation of the country especially in the areas which often are hit by natural disasters so that they may be able to cope with the related emergencies in the rapidly changing physical environmental conditions. Hence, the existing curriculum of HSS Geography needs comprehensive review and revision to update and add the knowledge related to natural hazards.

DISCUSSION AND CONCLUSION

Shortly after the Haiti earthquake Kofi Annan, former Secretary General of the United Nations, and co-recipient of the 2001 Nobel Peace Prize, wrote: "We cannot, of course,

^{iv} The average age of the students at Grade XII is normally from 16 to 17 years.

prevent natural disasters like the earthquake in Haiti. But we can help fragile states and their populations to overcome the chronic vulnerabilities caused by underdevelopment and long-term neglect (The Guardian, 21 January 2010).” Following the implementation of the UNESCO and United Nations Environment Program International Environmental Education Program, as well as the Belgrade Charter, A Global Framework for Environmental Education, the government of India has initiated various guidelines for Environmental Education Programs at Higher Secondary and Higher Education stages (The Hindu, 2002, cited by Singh, 2007). Although Pakistan has significant geo-political importance in the region, the progress of the country towards education is not encouraging since its independence as compare to that of its neighboring countries (as China and India). Unfortunately, the country is often hit by natural disasters but still natural hazards related education is so far not being provided at HSS which is even compulsory subject in India since grade VIII.

Pakistan has an agriculture base economy. The frequent floods cause a huge loss to economy which takes several years to be normalized. According to IPCC (2007) reports, generally, the frequency of occurrence of more intense rainfall events in many parts of Asia has increased, causing severe floods, landslides, and debris and mud flows, while the number of rainy days and total annual amount of precipitation has decreased (Zhai et al., 1999; Khan et al., 2000; Shrestha et al., 2000; Izrael and Anokhin, 2001; Mirza, 2002; Lal, 2003; Min et al., 2003; Ruosteenoja et al., 2003; Zhai and Pan, 2003; Gruza and Rankova, 2004; Zhai, 2004, cited by Cruz, et al., (IPCC), 2007). The preparation for the future challenges is the responsibility of the Government of Pakistan. The government or people living in the country can't control the natural disasters. However, the government and policy makers may take initiatives to design and implement a new curriculum concerning education about natural hazards and disasters management or include the contents of natural hazards in in curriculum of Geography and this subject may be opted as a compulsory subject at Secondary and Higher Secondary School level. By providing the necessary education related to natural hazards and disasters management at secondary and HSS levels, the human and capital loss can be reduced many folds.

ACKNOWLEDGEMENT

We acknowledge the support of the Higher Education Commission Government of Pakistan for providing PhD scholarship to author 1, 2 and 3 and the University of Sargodha, Pakistan for providing research facilities and computing materials to author 1.

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