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Climate Change: Analysis of Disaster Education at Primary School level

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Abstract

Education plays vital role for the fulfilment of needs regarding every aspect of life. From livelihood to life skills, education is the only source which Provide the right path to achieve the desired goal. For the proper education, curriculum is the essential part by which over all activities are carried out. The fluctuating environmental conditions lead the various natural disasters around the world. Due to the natural disasters human being pay a lot of loss in various forms. Above of all, in the large number of people died every year and the rate of mortality is increasing year by year particularly the children are at great risk. To cope the various calamities, the states of the world provide the education for awareness and skills from primary to higher level. Like the whole world, the Sindh Province is facing various disasters such as floods, drought, viral and bacterial diseases, heavy rains and so on. Due to unawareness and lackof skills among the people cause of heavy human and material loss. In this connection the disaster management education is fundamental part for everypeople to acquire life skills and the curriculum is the key part of such discipline. The children are considered the future generation and the imparting of education to children can cause the beneficial to whole of their lives. In this connection the primary education is crucial stage for the human being. The objectives of this study isto review of curriculum and textbooks at primary Level, finding the skills among the teachers, activities carried out at schools and giving recommendations in terms of disaster management. The study deals with the instructional material (textbooks) and curriculum. The mixed method was adopted. The questionnaire developed for the teachers comprised on three parts, closed ended, partially closed ended and qualitative. The unstructured interview conducted from head of schools. The finding of the study was that there must be balanced curriculum equally cover the all types of disasters happening in Sindh. Teachers must be skilled and trained. Resources must be provided to carry out the curricular activities in terms of disaster management.

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Keywords: Subject matter, Disaster Management, Calamities, Chi square, textbook

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INTRODUCTION

Disaster is "a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources" (UNISDR:2009). There are many kinds of disasters categorized into natural and manmade. Further the natural disasters are categorized into various kinds. In which flood, drought, cyclone heavy rain and so on. There have been many natural calamities happened since centuries in which people have beard the human and material loss due to the lack of knowledge and rapid climatic changes all around the world. The statistics of losses depend on the intensity of calamity and the knowledge and awareness for coping the disasters in the efficient way. For the handling the harsh

situations like natural disasters, the people are educated in all countries in the world. There can be formal and informal education by the various sources. By the changing climate and the damages due to disasters, the disaster management (DM) is the crucial part of education. The factor Disaster management is related with various stages of disaster handling in which preparation, responding and recovery are the most crucial. In the many countries the DM matter has been included in the curriculum at various levels. In the Indonesian educational system, the disaster risk matter is included in the curriculum. According to the capacity and level of students have to prepare for the disaster situations. There are five phases of disaster management. The young children are mostly affected in the disasters because of physical and immunity power and lack of awareness to tackle the situation. The children can play the significant role for the individual and society.

Convey the knowledge at school or outside the school by various methodologies is the very considerable stage according to the nature of topic. There can be curricular and co-curricular teaching and learning activities but both parts are inter related. Some goals are fulfilled by the co-curricular activities. In connection with co-curricular activities, the assignments to the students for outside the school is the part of curriculum which can be the source of knowledge and experience the problems and their solutions and sharing with the peers and teachers for coping the disaster situation.

At Sindh level, the human and material losses are due to the most frequently happening flood and heavy rains particularly the most affected are the rural areas due to the lack of knowledge and awareness for handling the various unpleasant situations. Children have much learning capacity and vulnerable in the disasters. Educating the children can be source of knowledge and skills of the whole family particularly for the illiterate community where the parents don't know about according to situation. The Sindh Province may be divided into various regions according to the disaster vulnerabilities.

The early education is an important stage for the child development and his further education. There are various types of curriculum. In which the written curriculum is in the black and white form to follow the educational management for achieving the aims, objectives and goals. The curriculum is considered the backbone for teaching and learning process. The written curriculum is a written plan for the overall educational activities conducting in educational institutions. The curriculum must be according to the needs of individual and community.

To develop the potential of the pupils the Disaster Management Education is fundamental part in the cotemporary situation due to the climatic changes happening all around the world. The teaching strategies are according to the nature of topic and problems faced by the students. For lessening the impacts of damages, there must be the pupils aware for the various vulnerable situation and for that there will be applicable and according to situation and need of society, subject matter must be included in the curriculum.

In the written curriculum various patterns of teaching and learning must be included on the modern bases in context with disaster management education (Yin et al., 2025). There are various methods of learning in which project-based learning, task-based learning and problem-based learning for achieving the whole objectives and enhancing the skills in the various situations. In the project-based learning students learn in the practical way. According to author "The curriculum must be inclusive and tailored to the needs of children in different or difficult circumstances." (Craissati et al: 2007).

LITERATURE REVIEW

According to the [Pezard](#) "The curriculum in connection with the disaster lessening knowledge from primary to tertiary level in education and extracurricular engagement about disaster risk education are at large level (2005). According to Chaube and Chaube, the children are the future of the community and consequently the better education is crucial for them (1994). According to Sidhu, with the curricular learning, there is significant role of co-curricular education and it is supplementary in the routine work of school (1996). According to Wellington and Grenlreson, there is great relation between learning at school and along within the society has importance (2008). According to author, it is fundamental, to educate the people and children with program of disasters and their damages coping in the country (Gorzia: 2001). According to writer, it is found that the learning of children in school vindicate the experience impact the achievement and simultaneously, the schools should meet the requirement of students (Qadiret al.,2024). According to Wellington, for the curriculum development, there are various factors considered such as aspirations of students, interest, needs, problems and capacity of student along with expectations (2008).

According to researcher, the curriculum development approach should be adapted in such a way that it is sustainable, skill oriented with deeper learning in the light of learning level (Cambridge:2014). According to Ceil D.Mercer and Ann R. Mercer, the educationists must adapt various teaching approaches that facilitate them to meet the challenges of students learning problems (1989). According to the researcher, it is essential to educate about disaster management with the formal curriculum at various levels of education (Deborah Rea:2007). According to Barge, the project based learning experience the students with the problem and engage for understanding with it to meets the objectives of educational institution (2010). According to the author The project based education depends on the learner aspiration and expectation and that is much effected than the conventional method (De Graaf, E., & Kolmos: 2003).

By increasing the losses because of calamities, the students' unawareness, lack of education and skills for handling the situation for self, family and community, the disaster management education is fundamental to lessen the harsh impacts. At Sindh level people have been facing the flood, heavy rains and drought at various regions and suffered from heavy loss in the form of human life, livestock and damages of infrastructure various. For educating the students in connection with disaster management, the curriculum plays essential role to get update knowledge and develop skills.

- To review the Primary School curriculum and textbooks in terms of Disaster Management topics.
- To explore the teachers' skills to for conducting the activities in terms of Disaster Management Education at Primary school level
- To find out the activities carried out at Primary school level in terms of Disaster Management Education
- To give the Suggestions in the Primary School curriculum in terms of Disaster Management.

SIGNIFICANCE OF STUDY

The Disaster Management Education is considered essential part of the developed and developing countries due to the growing heavy losses globally. Almost every country is facing this situation. This study leads the analyzing the curriculum in context with the disaster management education at Sindh level. To analyse the quantitative and qualitative subject matter and methodologies for the teaching and learning to develop the awareness, knowledge and skills among the students in the written curriculum.

- How much Primary School Curriculum and textbooks are qualitative in terms of Disaster Management.
- How much teachers are skilled for teaching in terms of Disaster Management Education?
- What are the types and number of activities carried out at schools in terms of Disaster Management Education?

Delimitation

The study was focus on the Disaster Management Education in terms of natural disasters happening in the Sindh Province. The target population was public sector Primary Schools and National Curriculum (Primary) and Textbooks of Sindh Textbook Board.

RESEARCH METHODOLOGY

The research design was mixed method. The tools developed in the form of interview and closed ended questionnaire. Questionnaire categorized into three parts, closed ended, open ended and partially closed ended items. The population considered the all-Government Primary (Boys and Girls) Schools of Jamshoro District. The sampling for the data collection was from the Talka Manjhand, District Jamshoro. The data collected from 81 schools (Girls and Boys). The data collection from 175 teachers (male and female). The interview conducted from 35 Head of schools (Girls and Boys). The subjects selected for the review of curriculum and textbooks were Sindhi, Urdu, English, General Knowledge, General Science, Social Studies. The reliability and validity were tested by experts of Sindh Textbook Board and Bureau of Curriculum Jamshoro and cross check with results present study.

Analysis of Data

The curriculum and textbooks analysed qualitatively. The closed ended data analysed by percentile and tested through chi-square statistics. The interview discussion analysed descriptively.

Table 1.

Curriculum

Subject	Subject Matter
English Language I-VI (2012) Bureau of Curriculum Sindh	No matter
General Knowledge I-III (2012) Bureau of Curriculum Sindh	No matter
General Knowledge IV-VI (2012) Bureau of Curriculum Sindh	No matter
General Science IV-VIII (2006) National Curriculum	No matter
Urdu, Sindhi	No matter
Social Studies I-V Bureau of Curriculum Sindh	Natural disasters (floods, earthquakes, cyclones, avalanches) and safety measures

Table Curriculum shows that there is only Social Studies in which some subject matter is included in terms of disasters

Table2.
Grade –I Textbooks

Subject	Sindhi PehryonKitab (Sindhi First Book)	Subject	General Knowledge-I
Tot: No. of L/C	23	Tot: No. of L/C	50
No.of L(s)/C(s)	06	No. of L(s)/C(s)	Unit (03)No.(03): Unit(04) No.(03): Unit(05)No.(05-07)
Text/Subject matter	Hygiene (cleaning)	Text/Subject matter	Cleaning
Disaster Category and type of matter	Epidemic for Awareness	Disaster Category and type of matter	Epidemic for Awareness

Source: Sindh Textbook Board

Table 1 shows the subject matter is in connection with the hygiene/cleaning and at certain extent associated with the Biological Disasters for the awareness from the viral/bacterial diseases (Li et al.,2024).

Table 3.
Grade-II Textbooks

Subject	SINDHI	Subject	General Knowledge-II
Tot: No. of L/C	27	Tot: No. of L/C	40
No. of L(s)/C(s)		No. of L(s)/C(s)	Unit (06)No.(05): Unit(07) No.(02): Unit(10)No.(03)
Text/Subject matter	No matter	Text/Subject matter	Environmental (introductory)
Disaster Category and type of matter		Disaster Category and type of matter	Calamities Causes, negative impacts of echo system

Source: Sindh Textbook Board

Table 2 shows the subject matter is in connection with the hygiene/cleaning and at certain extent associated with the Biological Disasters for the awareness from the viral/bacterial diseases. There is some subject matter related with the environmental conditions and there harsh impacts in the form of natural calamities.

Table 4.
Grade-III Textbook

Subject	Sindhi	Subject	General Knowledge
Tot: No. of L/C	29	Tot: No. of L/C	43
No. of L(s)/C(s)	19	No. of L(s)/C(s)	Unit (01)No.(08): Unit(10)No.(03) Unit(06) No.(01-02):
Text/Subject matter	Environmental	Text/Subject matter	Environmental impacts and Cleaning
Disaster Category and type of matter	Echo system	Disaster Category	environmental and Epidemic

Source: Sindh Textbook Board

Table 3 shows the subject matter is in connection with the hygiene/cleaning and at certain extent associated with the Biological Disasters for the awareness from the viral/bacterial diseases (Huo et al., 2024). There is some subject matter related with the environmental conditions.

Table 4a.
GRADE –IV Textbook

Subject	Sindhi	Subject	Sindhi
Tot: No. of L/C	28	Tot: No. of L/C	
No. of L(s)/C(s)	14 and 20	No. of L(s)/C(s)	18

Text/Subject matter	Malaria diseases and pollution	Text/Subject matter	Historical: super flood 2010. Note for teacher for preparation in terms of flood
Disaster Category and type of matter	Epidemic environment	Disaster Category and type of matter	Flood

Source: Sindh Textbook Board

Table 4a shows the subject matter is in connection with the Biological Disasters for the awareness from the viral/bacterial disease. There is some subject matter related with the knowledge about super flood 2010 and there is assignment given to teachers in terms of preparation for the flood.

Table 4b.

GRADE –IV Textbook

Subject	Science	Subject	Science
Tot: No. of L/C	10	Tot: No. of L/C	
No. of L(s)/C(s)	01	No. of L(s)/C(s)	03
Text/Subject matter	Chocking of food, ulcer disease	Text/Subject matter	Cleaning, vitamins, proteins, hydration causes, symptoms and remedies
Disaster Category and type of matter	First aid and Awareness for ulcer	Disaster Category and type of matter	Epidemic

Source: Sindh Textbook Board

Table 4b shows the subject matter is in connection with the hygiene/cleaning and at certain extent associated with the Biological Disasters and ulcer for the awareness from the viral/bacterial diseases (Abaidullah & Basheer, 2024). There is some subject matter related with the first aid regarding the chocking of food in the throat and causes of diseases due to deficiencies of vitamins and proteins.

Table 4c.

GRADE –IV Textbook

Subject	Urdu	Subject	Social Studies
Tot: No. of L/C	23	Tot: No. of L/C	10
No. of L(s)/C(s)		No. of L(s)/C(s)	03 and 04
Text/Subject matter	No matter	Text/Subject matter	Causes of migration (IDPs) (drought, flood), environmental, preparation
Disaster Category and type of matter		Disaster Category and type of matter	Flood and Drought

Source: Sindh Textbook Board

Table 4c shows the subject matter is in connection with the reasons behind the migration of people in which the floods and drought are from them. There is matter of preparation for the disasters (flood, earthquake and storms).

Table 4d.

GRADE –IV Textbook

Subject	English	Subject	
Tot: No. of L/C	30	Tot: No. of L/C	
No. of L(s)/C(s)		No. of L(s)/C(s)	
Text/Subject matter	No matter	Text/Subject matter	
Disaster Category and type of matter		Disaster Category and type of matter	

Table 4d shows that there is no subject matter in connection with Disaster Management Education.

Table 5a.

GRADE – V Textbook

Subject	Sindhi	Subject	Sindhi
Tot: No. of L/C	28	Tot: No. of L/C	
No. of L(s)/C(s)	14	No. of L(s)/C(s)	15
Text/Subject matter	Hepatitis (symptoms, causes, treatment)	Text/Subject matter	Cleaning
Disaster Category and type of matter	Epidemic	Disaster Category and type of matter	Awareness for Epidemic

Source: Sindh Textbook Board

Table 5a shows the subject matter is in connection with the hygiene/cleaning and at certain extent associated with the Biological Disasters for the awareness from the viral/bacterial diseases.

Table 5b.

GRADE – V Textbook

Subject	Sindhi	Subject	Sindhi
Tot: No. of L/C		Tot: No. of L/C	
No. of L(s)/C(s)	20	No. of L(s)/C(s)	22
Text/Subject matter	Scouting and Girls Guide (awareness), assignment for formation of scout group	Text/Subject matter	Volunteer services during calamities
Disaster Category and type of matter	Awareness for Welfare service	Disaster Category and type of matter	Awareness for Welfare service

Source: Sindh Textbook Board

Table 5b shows the subject matter is in connection with the Scouts and Girls Guide related with the history and services of scouts/girls guide and assignment to teachers given for the formation of scout groups of students at school. The subject matter regarding with the r services of volunteers.

Table 5C.

GRADE – V Textbook

Subject	Science	Subject	Science
Tot: No. of L/C	10	Tot: No. of L/C	
No. of L(s)/C(s)	02	No. of L(s)/C(s)	04
Text/Subject matter	Bacterial and viral diseases awareness, dengue symptoms and causes	Text/Subject matter	Pollution
Disaster Category and type of matter	Awareness for Epidemic	Disaster Category and type of matter	Environmental awareness

Source: Sindh Textbook Board

Table 5C shows the subject matter is in connection with the hygiene/cleaning and at certain extent associated with the Biological Disasters for the awareness from the viral/bacterial diseases. There is some subject matter related with pollution which is associated the environmental awareness.

Table 5d.

GRADE – V Textbook

Subject	English	Subject	Social Studies
Tot: No. of L/C	30	Tot: No. of L/C	13
No. of L(s)/C(s)	Unit (5), reading 5.2	No. of L(s)/C(s)	
Text/Subject matter	Story about 2010 flood	Text/Subject matter	No matter

Disaster Category Historical
and type of matter

Disaster Category
and type of matter

Source: Sindh Textbook Board

Table 5d shows the subject matter is only in the story form for just only superficial knowledge about 2010 flood.

There are various types of disasters happening in the Sindh Province categorized in the biological hydrological and meteorological whereas the curriculum and textbooks don't cover all the happened disasters. The most subject matter in the textbooks related with the cleaning/hygiene associated with the precaution from the viral and bacterial diseases which may counted for the Epidemic.

Opened ended Questions

Table: population and Sample for the study

Population		Sample		
Schools	Teachers	Schools	Teachers	Head of Schools
		N	N	N
		46%	46%	20%
178	383	81	175	35

RESULTS

Item 1.

Knowledge about Disaster Management

Options	Very high	high	Neutral	Low	very low	Total	χ^2
Frequency	25	90	05	30	25	175	204.92
Percentile	14.28	51.42	2.85	17.14	14.28		

Item 1 table shows χ^2 is 204.92 which is higher than 9.488 at significant level= 0.05. The responses indicate the 51% teachers have knowledge about Disaster Management.

Item 2.

Study about Disaster Management literature

Options	Yes	No	Total	χ^2
Frequency	70	105	175	7
percentile	40	60		

Item 2 table shows χ^2 is 7 which is higher than 3.841 at significant level= 0.05. The responses indicate the 60% teachers have not studied Disaster Management literature.

Item 3.

If yes, type of literature

Options	Book	article	pamphlet	campaign brochure	Other
Frequency	35	15		10	
percentile	20	8.57	0	5.714	

Other

	No	Electronic media
	110	10
percentile	62.85	5.71

Item 3 shows the 62% have not studied any DM literature whereas 35% studied in the form of books.

Item 4.

Type of disaster(s) literature study. Please Specify

Options	Flood	Earthquake	Tsunami	Tornado	No understanding
Frequency	50	20	15	05	110
percentile	28.57	11.42	8.571	2.85	62.85

Item 4 table shows the 50% teachers know about the flood disaster and 20% about earthquake by the literature.

Item 5.**Knowledge about the types of natural disasters happen in sindh? Please specify**

Options	Floods	Earthquake	Rain	Storm	Tornado	No
Frequency	125	40	20	10	05	15
percentile	71.42	22.85	11.42	5.71	2.85	8.57

Item 5 shows the 71% respondents aware about flood and 22% about earthquake

Item 6.**Teaching Classes about Disaster Management. Please Specify**

Options	One	Two	Three	Four	Five	No
Frequency		05	15	60	75	60
percentile	0	2.85	8.571	34.285	42.85	34.28

Item 6 shows the 43% respondents teach at class 04 and 42% to class 05 whereas 34% don't teach about disaster management.

Item 7.**Teaching process carried out in terms of Disaster Management in this school. Tick possible options**

Options	Talking	discussing	listening	Drills	Nothing
Frequency	65	50	10	0	25
percentile	37.14	28.57	5.71	0	14.28

Item 7 shows the 37% respondents teach through talking about disasters whereas 28% go through discussion with students.

Item 8.**Written plan/document for Disaster Management Education**

Options	Yes	No	total	x2
Frequency	15	160	175	120.14
percentile	8.57	91.42		

According to Item 8, 91% respondents shows there is no written disaster management education plan/ document at school.

Item 9.**If yes item 8, subject matter in the plan for Disaster Management Education. Specify**

Options	Nothing
Frequency	175

No plan for disaster management education

Item 10.**If yes, developer of that plan in terms of disaster management education**

Options	School management	district management	I any govt. organization	don't sure
Frequency	05	20		150
percentile	2.85	11.42		85%

150 (85.71%) don't sure

Item 11.**Placement of plan?**

Options	In Master office	Head library	students	DEO office	Other
Frequency	15				
percentile	8.57				

Item 9 to 11 table show that there is no existence of disaster management education plan at school.

Item 12.**Type of education given in terms of Disaster Management according to plan**

Options	Self survival	family support	awareness	community support	don't sure
Frequency	20		20	05	130
percentile	11.42	0	11.42	2.85	74

Item 12 table shows the 74% respondents don't sure about imparting of disaster management education whereas 11% indicate 20% education for self survival.

Item 13. Types of resources available in this school in terms of Disaster Management Education

Options	Financial	equipments	literature	don't sure
Frequency	0	0	15	160
percentile	0	0	8.57	91.42

Item 13 table shows the 91% respondents have don't sure about the available resources at school level for the disaster management education.

Item 14.

If option b then specify the types of equipments in terms of disaster management education

Options	kit	Fist aid box	Rescue material	Other	Nothing
Frequency	0	0	0	0	175

Item 15.

Periods are there in a day in this school timing in terms of disaster management education

Options	5	6	7	8	Other: No
Frequency	0	0	0	0	175

Item 16.

Duration of a period regarding disaster management education

Options	20 mint	25 mint	30 mint	40 mint	Other: No
Frequency	0	0	0	0	175

Item 17.

Periods are there for Disaster Management Education in the month. Specify

Options	
Frequency	

No timetable

Item 15 to 17 tables show there is no time table at school and that further investigated by the interview.

Item 18.

Conducting of Disaster Management activities in a year

Options	Once	twice	thrice	four times	Other:NO
Frequency	10	0	0	0	165
percentile	5.71	0	0	0	94.28

Item 18 table shows that there is no disaster management educational activity conducted at school.

Item 19.

Type(s) of drills carry out in school. Specify

Options	Once	Twice	Thrice	Four time	No
Frequency	0	0	0	0	0

Item 19 table shows that there is no disaster management educational activity conducted at school.

Table Adjectives.

Adjectives list of Interviews from Head of Schools (N=35)

Adjective	No timetable	Teachers disposal	Teachers shortage	No responsibility	No resources
Frequency	35	31	31	29	32
Percentile	100	88.57	88.57	82.85	91.42
Adjective	No training	No budget	No plan	No time	No skill
Frequency	32	33	34	32	30
Percentile	91.42	94.28	97.14	91.42	85.71

Table adjectives shows there is no timetable at primary schools. There is on the disposal of teachers for the time management and completion of syllabus (Basheer et al., 2024). There is shortage of teachers lack of budget, no training and skills for this particular discipline and lack of resources. Theses cause the lack of education in terms of disaster management.

FINDINGS

According to present study, there is little subject matter in the curriculum only in the Social Studies in terms of disasters. In the Textbooks subject matter may be considered with biological diseases in connection with only hygiene/cleaning, some about first aid environmental conditions and bacterial diseases. There is some subject matter related with the knowledge about super flood 2010, this matter is for preparation regarding the disasters (flood, earthquake and storms).

The present study find, the teachers have some knowledge about Disaster Management without any study, they only know about flood disaster. Some teachers teach about disasters at class 4 and 5 through lecture and discussion method. This study found, there is no plan and activity conducted at school level for disaster management education. Furthermore, the current study found that there is no specific budget for disaster management education.

CONCLUSION

Due to climatic changes all over the world, there is needed for the disaster management education in form of various methods. There is the best way of imparting the education by the proper formal curriculum which fulfil the individual's community needs. By which students learn life skills and motivated for the welfare and volunteer activities at various levels and stages according to their capacity. The younger children are mostly affected in the disasters and lack of awareness and skills make them indulge in the harsh and severe situations. Teachers feel responsibility by inclusion of subject matter in the curriculum and they want to chase the target for achieving aims, objectives and goals regarding the curriculum contents.

RECOMMENDATIONS

Formal curriculum should be developed in terms of disaster management education. There should be balanced proportion subject matter for all categories of disasters happening frequently in sindh Province particularly there should be ensured the main focus of disaster education is according to the vulnerability of the areas where the students live and schools are situated. The professional training should be given to teachers for imparting the education among the students. Due to the lack of budget, there is no activity conducted practically. Therefore, special budget is allocated for this purpose.

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