DEVELOPING A CULTURE OF DISASTER MITIGATION THROUGH EDUCATION
A K-12 Project

Case Study Of
Savanna-La-Mar Primary, Jamaica

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1. Introduction

In the Spring of 2002, the Global CDMHA (Center for Disaster Management and Humanitarian Action) at USF (University of South Florida) in Tampa, and the International Hurricane Center (IHC) at Florida International University in Miami started a collaborative initiative called “Developing a Culture of Disaster Mitigation through Education”. Isabelle Simon from the Global CDMHA at USF was Co-PI for this initiative and is the point of contact for any comments or questions you may have regarding this project. She can be reached at 813-974-2907 or isimon@hsc.usf.edu.

The following report gives a brief overview of the various “steps of the way” that took place during the first phase of this initiative, and concentrates on the case study of Savanna-la-Mar Primary, Jamaica, one of the four schools that participated in the program. This report comes with a Project Manual, which gives guidelines for teaching about the critical concepts of hazards, damage, vulnerability and mitigation by using existing programs in science, language arts, social studies and others. It contains sample lessons plans and other resources that can be used in the classroom.

Once the needed funds for the project were in place, the team worked on identifying four schools that would be willing to participate in the initiative. The original idea was to select 1 school in the Miami Dade/Broward area, 1 school in the Tampa Bay area, and 2 schools in the Latin American and Caribbean (LAC) region.

The team started its search for public schools in mid-February 2002, and after 2 weeks into the search in the Tampa Bay area, we came to realize that we would not be able to find any school willing to participate there. The curriculum supervisors of both Hillsborough and Pinellas counties were reluctant to ask any teachers to deal with disaster related issues in class during the Spring semester 2002, as disasters and preparedness were studied in the Fall 2001. The approaching date of the FCAT examination in March that Florida schools are subject to was another factor that impaired the willingness of many schools and teachers to participate in the initiative that time of the year.

The four schools that were selected for this pilot project were:

- Maritime and Science Technology Academy (MAST), Miami, Florida, USA (Designated Teachers: Alvin C. Hawkins, Howard Glass) [High school, English/Spanish urban]
The choice of having a mix of English/Spanish, urban/rural, elementary/high school, and USA, Caribbean, and Latin America to initiate the program was deliberate. The ultimate objective being the development of a culture of disaster mitigation in a vulnerable community via a system wide program that can be used and adapted to specific areas and needs, it was important to us, and to the future success and expansion of such initiative, to be able to verify that the same mitigation content can be taught and learned regardless of age, language or location.

2. Training Meetings

Two training type meetings were held with the core team as well as the consultants (lead teachers) of the four participating schools.

2.1. The first training meeting with the four participating schools was held on February 15, 2002.

The purpose of this meeting was for the core team to go over all the logistics (program content & administrative issues) of the project with the participating teachers. This included:

2.1.1. Content: [this part covered 2/3 of our meeting]
- A structured overview of the content of the program (goal = mitigation)
- planning of our timelines for activities
- sharing of guidelines to construct the lesson plans (classroom + school wide activities)
- sharing of sample lesson plans at various grade levels
- repartition of each team member’s duties & responsibilities (with work statements & deliverables)

2.1.2. Administration:
- Procedures for payments/reimbursement for expenses (based on deliverables)
- Procedures for organizing school wide event
- Procedures for feedback, comments, evaluations, assessment, etc...
- Planning for last group working meeting
- Feasibility of a Summer workshop

2.2. The second training meeting with the four participating schools was held on April 26, 2002.

The purpose of this meeting was to review the project’s objectives, get an overview and status of each school’s doing in regards to the program, and discuss future plans such as the summer workshop and the Andrew+10 Summit in June 2002 in Miami. The meeting was divided into two main parts, a presentation from the Principal Investigators and presentations from each lead teacher on the status of their activities.

2.2.1. Principal Investigator’s Presentation
2.2.1.a. Review of Objectives

The Principal Investigators went over funding sources and reviewed the need for initiatives such as the “Developing a Culture of Disaster Mitigation” project. They reemphasized that hazards keep happening, yet mistakes are being repeated and signals ignored. The key to start changing people’s behavior is therefore to EDUCATE them.

The 5 key concepts were explained, as they are crucial for the teachers, and the children in their classes, to understand and not confuse with other terms: the 5 key concepts are:

- Vulnerability
  Absolute, Relative
- Hazards
  Natural, Human
- Damage
  Direct, Indirect, Consequential
- Mitigation
  Damage reduction
- Emergency Management
  Mitigation, Preparedness, Response, Recovery

Each category was illustrated with examples. The objective of the program is “mitigation”, and it was emphasized to the teachers that they needed to keep this in mind while doing activities with the students. “Mitigation” means “reducing damage” and is “long term”. When working with the children, the teachers were asked to think in terms of “if I do this, will I prevent damage from happening”? If the answer is “yes”, then it is mitigation. If the answer is “no”, then it is not mitigation but maybe just preparedness. It was also emphasized that via mitigation, we will reduce our recovery time after a natural phenomenon since we would have less damage.
2.2.1.b. Timelines:
Since everyone had a late start, teachers were given until the end of May to deliver their individual lesson plans in their classrooms and implement the school-wide activity. They were given until mid June to submit their evaluations, final reports/findings, and recommendations to the core team.

2.2.1.c. Andrew+10:
The upcoming 10th anniversary summit of hurricane Andrew to be held at FIU on May 29-31, 2002 was mentioned during the meeting. It was decided that we will have tables with displays of the project from the various schools. Teachers were asked to think about what they wanted to include on the displays, noting that it could be from classroom activities as well as from the school wide activities.

2.2.1.d. Workshop:
A tentative summer workshop for teachers was also discussed at the meeting. Objectives of the workshop are to: introduce the 5 key concepts to teachers, show them what has been done in the four participating schools, and start a ripple effect of getting more schools involved in the initiative. See details in the “workshop” section further below.

2.2.2. Teachers’ Presentations
- Each teacher gave a brief count of their respective activities. The Jamaican teacher could not be present, but provided her information to Isabelle Simon, who presented it to the whole team. Every school had a late start, so the activities that originally were scheduled to end early May, were extended to early June.
- All the schools had involved the parents, which proved useful, as it was revealed through a survey that the parents themselves did not know much about disaster mitigation or preparedness, and were confusing the two.
- The four schools combined different cultures, different age groups, dealt with different realities (i.e.: building structure or access to electronic resources), therefore the classroom activities varied widely from one school to another. Yet, the concepts being introduced were the same, and the children seemed to have been able to grasp them so far.
- All the schools were planning a symposium, or “Mitigation Expo 2002” as a school wide event to wrap up the program at the end of May, or first week in June.
2.2.3. Comments

The meeting proved useful and helped the teachers better understand the difference between disaster “mitigation” (long term-reduce damage) and “preparedness”. It also helped realize that although working in different environments, the teachers were facing the same issues when dealing with the parents, who have to be educated too about mitigation. Teachers had a chance to exchange and share lesson plans and activities as well. Although all the schools experienced a delay in getting started, especially the Jamaican school, the program was working smoothly overall, and was getting a positive response from the teachers, principals and parents associations of the schools involved.

3. Case Study – Savanna-la-Mar Primary, Westmoreland, Jamaica

3.1. The School

3.1.1. Geography
In the parish of Westmoreland, in South West part of the island.
In the coastal town of Savanna-La-Mar, most of which is below sea level
In rural area

3.1.2. Geology
Most common natural phenomena = flooding, hurricanes, earthquakes, deforestation = representative of issues in the entire island

3.1.3. Physical Infrastructure
One entry-exit, gated
In a “U” shape, one side being a 2-story building
Concrete blocks, no glass windows. Openings for ventilation = through spaces left between blocks. No AC except a window unit in Principal’s office and in computer lab.
Classrooms in each building and on each floor separated by black boards only. Six to seven classes going on at one time on each floor, making the daily classroom teaching environment very noisy & loud.
Very large playfield, littered with garbage, shared with neighbor kindergarten & high school + city for community events

3.1.4. Organization
Two-shifts schedule 7:30 am-12:00 & 12:30pm-5:00
Grades 1 through 6, two of each, one in the morning, one in the afternoon
2000 students
40 teachers
Average of 50 students per class
Up to 3 children per 2-seater benches
1 computer lab with 12 computers and 4 printers
Up to 4 students per computer
1 small library with about 200 books. Sitting capacity = 30

3.2. Trips to the School by Co-Principal Investigator
Co-Principal Investigator Isabelle Simon visited Savanna-la-Mar Primary twice during the length of the program.
1) The first trip was made from April 29 to May 3, 2002. The lead teacher at the school was experiencing difficulties in putting together the required deliverables to deliver the “Developing a Culture of Disaster Mitigation through Education” program. The purpose of the trip was therefore to oversee what had been done so far in regards to the program, but also to provide additional guidelines as to the objectives of the program, what was expected of the teachers, and to assist them with designing classroom as well as school wide activities. See details in the “Phase 2-Fusing material into current curriculum” section.
2) The second trip was made from June 1-6, 2002. The purpose of the trip was to attend the “Mitigation in Action” symposium 2002 organized as a school wide event. See details on the symposium in the “Phase 3- Outreach” section.

3.3. The Approach
3.3.1. Phase 1 = Making Contact
- Co-PI Isabelle Simon knew the Principal at Savanna-la-Mar Primary and had been at the school a year before the core team started with the initiative.
- Introduced the project to Principal who selected one 5th grade teacher to be the lead teacher & consultant for the school
- Lead teacher attended in February the 1st of the 2 training meetings in Miami

3.3.2. Phase 2 = Fusing material into current curriculum
3.3.2.a. Classroom activities:
- Material on disaster mitigation was given to the consultant who shared it with the rest of the school staff
- The consultant then provided every teacher with the guidelines from the various deliverables, and shared all the resources and materials she had from the Red Cross, FEMA, CDERA and others with the rest of the teaching staff, who made photocopies.
- All classes and staff were shown the Red Cross videotape that came with the package that was provided at the 2nd meeting in Miami as an introduction to the program. Posters and both fire and hurricane safety had recently been posted on many walls of the school, in areas the children could see them best (at their eye level, near the canteen, bathrooms, etc...).
- Every teacher taught all subject matters, and issues related to disasters were being used as a platform to teach the various subject matters. At the beginning phase of the program, teachers set the stage for teaching disaster mitigation by concentrating their first activities on identifying the various types of hazards, understanding how and when they form/happen.
- The various activities the children originally worked on included: weather reports, poems/songs about lightning, do's & don'ts during lightning, a wind speed log, reports on hurricanes that affected Jamaica, cloud reports. The 5th and 6th graders were keeping a folder for each theme in the classroom.
- Based on sample lesson plans on mitigation that were provided by the core team, teachers drew their own mitigation lesson plans using provided mitigation material and according to grade level and subject matters (math, science, English, etc...) and so that the new mitigation material would blend in with the existing curriculum and complement it (see samples in K-12 Project Manual)
- As part of the Jamaican culture, songs, poems and dances were performed to illustrate disaster mitigation as well as arts & craft projects and other “hands-on” activities
- All grades had lessons on mitigation but because of time constraint grades 1 & 2 concentrated on weather in general + fire; grade 3 & 4 concentrated on weather in general + floods; grade 5 & 6 concentrated on hurricanes and earthquakes.
- Each grade teacher established a “family emergency contact list” with the names and phone numbers of the immediate family (parents, guardians) of each of their students. They kept the forms along with the roster. The administration at the school apparently did not keep this kind of records with them, so it was a first. Each class prepared its own first aid kit, and children brought items such as band aids, batteries, etc....
- Some classes built their own anemometer, so each day, one student went out in the school yard and measured the wind density. The entire class then observed and recorded the findings on a log based on the Beauford wind scale, which was posted on a wall of the classroom.
- Students also observed the movement of the trees and clouds in the sky to do their daily weather reports, and discussed their findings with the class.
- Cleaning of scattered garbage and recycling bottles which could become potential flying debris in case of high winds during a hurricane was done by the students. They put an action plan in place in order to keep the playfield clean as well as a tight lid on the recycling container.
3.3.2.b. Fire Drill:
- During the last week of April, and during the Co-PI's first trip to the school, a fire drill was executed during the afternoon shift, coordinated by the parish fire department. It had been at least three years since such a drill had been conducted at the school. As indicated earlier, the school is built in a "U" shape, and there is only one gated exit/entrance, guarded at all times.
- The drill had to be practiced twice in a row, as the first time proved disorganized and totally inefficient, and at least 20 students were "left behind" (disastrous if it had been a real emergency). The principal and assistant principal agreed to practice the fire drill on their own (without the help of the fire department) once a week for a few weeks until everyone (staff + children) got it in place.
- There was no fire/smoke detector, no fire alarm, and no fire extinguisher in the school at the beginning of the program. The school later used some of their funds to purchase 2 smoke detectors and 2 fire extinguishers that were to be placed by the cantina and in the computer lab. More should be purchased later, and the PTA was working on a strategy to raise funds to purchase such items.
- The alarm, in case of fire, will be given by the hand shook bell, used at the beginning and end of the day as well as for breaks. It will ring differently though (3 times) in case of an emergency. It was decided that the fire department would have to come back to practice the fire drill with the other half of the school.

3.3.2.c. Parental involvement:
- a mitigation assessment questionnaire was distributed at the beginning of the initiative, and at the very end (see Project Manual for sample), and results were compared, showing an increase in knowledge the second time around (see detailed evaluation in the "results" section of this report); b) parents helped children assess vulnerability of their home and neighborhood as well as the mitigation measures that were needed.

3.3.2.d. Key speakers:
- Mrs. Angela Tate, the disaster management coordinator for the parish of Westmoreland came and gave a presentation on disaster preparedness. Only the afternoon shift was able to attend the presentation due to technical and organizational problems that delayed the session more than three hours. It was decided that another session would be rescheduled for the morning shift.
- Mrs. Tate had prepared a power point presentation on the computer, without realizing that the school did not have the adequate equipment to enlarge the screen via a projector for everyone to see. The microphone system was malfunctioning, so she was unable to use it.
made it very difficult to catch the attention of 300+ children in these conditions. In the middle of the presentation, as icing on the cake, came a storm, which interrupted everything, as the strong rain knocking on the tin roof made it impossible for anybody to hear anything. After the storm, the presentation resumed and children had a chance to ask questions.

3.3.2.e. Field trip:
- One hundred grades 5 and 6 students from both shifts were selected to go to Kingston on a field trip on May 2, 2002. Places visited were the Earthquake Unit at the University of the West Indies, and the National Meteorological office at the Norman Manley International Airport and Port Royal.
- The main objective of this field trip was for students to get first hand knowledge from experts in the field of weather and climate and to become familiar with instruments used in measuring the different fluctuations of weather.
- Students were able to see how weather reports are being written as well as look at the different instruments and readings being used to categorize the different types of weather. Students were also able to see the instruments used to measure the intensity of an earthquake and how it works, and learned about the vulnerability to earthquake of the different sections of the island.
- At the end of the field trip, students gave written and oral reports to their classes on what they saw and learned, and wrote their own weather reports based on some techniques reviewed during the field trip.

3.3.2.f. Quiz Competition:
- A school wide quiz competition was held at the end of the program. Questions were based on what the students had learned about the different types of disasters and how they can mitigate for them. The two shifts competed against each other. The panel of judges consisted of co-PI Isabelle Simon, Disaster Coordinator for the Parish of Westmoreland Ms. Angela Tate, the quiz master and two teachers from both shifts. The first team to press the buzzer and being identified by the quiz master could answer. Two points were awarded for each correct answer and two were deducted for incorrect answers.
- Grades were paired together (1 & 2, 3 & 4, 5 & 6) and each shift, consisting of 6 students (3 first graders + 3 second graders and so on) on each team, competed in three categories:
  Category1 = weather in general & fire for Grade 1 and 2 (15 questions)*
  Category2 = weather in general & floods for Grade 3 and 4 (15 questions)*
  Category3 = hurricanes & earthquakes for Grade 5 and 6 (20 questions)*
* See actual questions in annex A
- The results from the quiz are shown in the table below and are discussed in the “results” section.

<table>
<thead>
<tr>
<th>Category</th>
<th>Grade Levels</th>
<th># of questions</th>
<th># of correct answers</th>
<th>Points awarded</th>
<th>Results in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 and 2</td>
<td>15</td>
<td>8</td>
<td>16</td>
<td>53.3%</td>
</tr>
<tr>
<td>2</td>
<td>3 and 4</td>
<td>15</td>
<td>13</td>
<td>26</td>
<td>86.6%</td>
</tr>
<tr>
<td>3</td>
<td>5 and 6</td>
<td>20</td>
<td>14</td>
<td>28</td>
<td>70%</td>
</tr>
</tbody>
</table>

3.3.3. Phase 3 = Outreach

- To community via a 3-day “Mitigation in Action” symposium held at the school the first week in June.
- The attendance was as followed: Approximately 95% of the students, 100% teachers and 30% of the parents. The main group targeted for this outreach exercise, the parents, was poor in attendance maybe due to the early start in the day of the function.
- Dignitaries present at symposium = Parish school board representative, Mrs. Gloria Gordon. Deputy Mayor of the Parish of Westmoreland, Mr. Comrie. Education officer from the Ministry of Education (MoE) for the parish, Mr. Ervin Green. Also present was Mr. Basil Chambers, Principal from a neighbor elementary school.
- Other invited guests unavoidably absent were: The Member of Parliament for Central Westmoreland, The Custos Rotulorum, The Mayor and the Regional Education Officer.
- Agencies & organizations present = The Jamaican Red Cross Society, The Coordinator for Disaster Preparedness for Westmoreland, the Westmoreland Fire Department, 2 insurance companies - NEM and Bank Of Nova Scotia. Information booths were set up by these agencies, and they all gave a presentation on their role and responsibilities in case of emergencies.
- Representatives from the media present were: The Jamaica Observer, The Daily Gleaner and Western Television. (WEST T.V).
- Teachers and some students from 4 neighbor schools were present.
- During symposium, 2-month worth of work on mitigation was presented. Students demonstrated their mitigation knowledge through songs, dances, and the reading of poems. Each grade’s arts & crafts projects were also exhibited.
- After the official function everyone was free to view the information booths and the display put on by the school. Literature on disaster preparedness and mitigation was given out by different booths. People were free to access information from personnel at the various booths. The function was officially declared by Ms. Isabelle Simon.
- A float parade preceded the official function. A truck decorated with brightly colored posters depicting Disaster Mitigation was driven through the streets of Savanna-la-Mar. Students who rode in the truck sang disaster mitigation songs they had composed. The
objective of the float parade was to sensitize people absent from the official function about disaster mitigation.

- The "Mitigation in Action" symposium was highlighted by the media. On June 6, 2002, an article appeared in the Daily Gleaner headlined 'Jamaica is Unprepared for Natural Disaster' and on June 9, 2002, the headline in the Jamaica Observer was 'Savanna-la-Mar Primary School students acts lesson on Disaster Preparedness'. Both newspapers are national newspaper read by more than 60% of the Jamaican population.

- On June 5, 2002, co-PI Mrs. Isabelle Simon and lead teacher Mrs. Salome Foster were invited to speak live on the local Western Television channel (West T.V) about the initiative. The 20-minute review was locally aired several times for a couple of days. The taping of the official function was also aired on several occasions. It is estimated that 70% of the population in the parish of Westmoreland watches the programs of West T.V., and although it would be presumptuous to say that 70% of the people in the parish did indeed view the show, we can safely say that the airing of the show did reach a wider number of people than those who were able to attend the function.

- After speaking live on television, Ms. Isabelle Simon and Mrs. Salome Foster visited the Deputy Mayor's Office to address the problem of illegal dumping of garbage on the playfield of the school. Mrs. Foster was invited by the Deputy Mayor to work closely with his office to spread the message of "disaster mitigation" to other schools and community groups in the parish of Westmoreland. Mrs. Foster will be taking up the challenge in the new school year.

- On June 6, 2002, Isabelle Simon was contacted by Professor Milton Pinock from the Department of Community Health at the Faculty of Medical Science at the University of the West Indies, Mona in Kingston. Professor Pinock has been involved in disaster management for several years. He had seen the article in the Daily Gleaner about the symposium and volunteered his expertise and experience in the field to assist with the initiative. Professor Pinock later met with Ricardo Alvarez and Isabelle Simon in Miami to discuss how he can work closely with the team in spreading the message of disaster mitigation throughout Jamaica.

3.4. The Obstacles

3.4.1. Organization

- Time was against us. Factors such as Spring break and national examination week had delayed the starting date of the initiative in the school and therefore left a very short time to train all the teachers, who had to learn the new key concepts almost at the same time as they were teaching them.

- The key concepts were difficult to grasp and confusing, sometimes more by the adults, who had some preconceived erroneous notions about the topic, than by the children themselves.
- Teachers were not sure what was expected out of them at the very beginning. At the first visit to the school from co-PI Isabelle Simon, about 2 weeks into the lesson plans, all classroom activities conducted at the school had been on disaster preparedness, none on disaster mitigation.
- The 2-shift system made staff meetings difficult to organize for the lead teacher. Meetings had to be duplicated, as well as any school wide drill (i.e.: fire emergency evacuation).
- School having very low funding could not afford to purchase all the necessary supplies for the initiative until they received money from the Global CDMHA, which delayed their starting date and forced them to crumble a lot of material in a short time.

3.4.2. Communication
- The lead teacher for the school, Mrs. Foster, was not able to attend the 2nd training meeting in Miami, which lead to her misunderstanding of some of the key concepts as well as what exactly was expected and required of her to do. This lead to confusion from the rest of teachers at the school, time being wasted, team work being delayed, and funding being sent late.
- Mrs. Foster is not computer literate. Only 1 out of 40 teachers at the school have advanced computer literacy, and 3 were beginners. Although computer literacy will not play a role in being able to teach mitigation in the schools in the future, the lack of that skill at the very beginning of our initiative, and while we are still in the process of getting the mitigation content fused into the existing curricula, proved problematic.
- This made lead teacher's task more challenging and slow as she would hand write every document, have a colleague type them up onto Word documents, and then have her son include documents as attachments for e-mails.
- Internet access is expensive in Jamaica (compare to US standards) and not reliable = once documents were e-mailed from US, it would sometimes take up to a week before the consultant could read e-mail. It made access to useful mitigation related URLs from the school limited as well.
- The fax machine at the school was broken, which forced us to use "snail mail", and forced school to go in town to use a fax machine when needed
- Overall communication was slowed down tremendously, and what could have taken a day took at times up to 3 weeks.

3.5. The Results
- Overall, very positive response from the school (principal + staff + students). They realized the crucial need of training the population in mitigation measures starting at an early age, and welcomed Global CDMHA's assistance in providing curricula.
- Good response as well from the mayor’s office who committed to work collaboratively with the school. They will assist in implementing mitigation measures at and around the school (clean up garbage in play field + install additional fire extinguishers around school + repair & add efficient gutters to prevent flooding during heavy rains). They will also assist in selecting other schools, strategically geographically located in the parish so that to create a network of trained teachers who would then become trainers for their neighbor schools.

- Positive response as well from the Education officer from the Ministry of Education, who mentioned that the Jamaican K-12 curriculum was due for review and update, and that he will propose the infusion of disaster mitigation activities into the curriculum

- Enthusiastic response from local and national media (newspaper + TV), who not only covered the symposium in their articles and invited consultants to speak live on the initiative, but also volunteered to print & air any information on disaster mitigation measures (so that to reach a wider community).

- Parents have risen their knowledge about disaster mitigation as the following results from the questionnaires sent to parents show. The Before questionnaire was distributed at the beginning of the initiative, and the After, was distributed at the end:

**Before**

- 100% of the parents questioned knew about disasters and were aware of the different types.
- 95% of the parents have experienced some type of flooding at one time or another but all of them had experienced hurricane Gilbert in 1988.
- 60% of the parents said that they did not take necessary precautionary method broadcasted on the radio and the television seriously.
- 40% of the parents said that after learning about mitigation, they took precautionary measures seriously and battened windows, doors, fined roofs and cut down overhanging branches near to houses. This was the same set that stock up on non perishable food, candles and water.
- Approximately 80% of the parents questioned said that they are not prepared for a disaster. They have no insurance coverage for their houses and are not sure how to reduce damages due to disasters.
- 80% of the parents questioned do not have insurance coverage for their property. Only 20% have insured coverage.
- About 70% of the parents did not know how to reduce damages caused by disaster.
- 90% of them had no advice or they were not sure what type of advise they would give.
- Approximately 50% of the parents knew what to do in case of an earthquake. Many of the responses were: Go under a table, bed or stand in the doorway.
After

After the exhibition and symposium the same questionnaire was sent to parents to find out if they were knowledgeable about disasters and disaster mitigation and if their attitude towards disaster has been changed.

- 95% of the parents questioned said they would now know what to do differently if it happened again. They would take necessary measures such as ensuring that their roofs, windows and doors are properly protected and that their communities are cleaned on a regular basis (reduce flooding + flying debris). They would cut down over hanging branches near houses. In case of a fire they would use their fire extinguishers.

- Approximately 80% of the parents said that they felt better prepared for a disaster. They felt more knowledgeable about the precautionary measures to be taken to reduce damages.

- Parents said that they would follow the advise of personnel of the fire department and the ODPEM about reducing damages due to disaster.

- 70% of the parents said that they would know how to advise people about the necessary steps to be taken to reduce damages caused by disaster. The responses varied. They would advise them to:

  1. Insure their houses.
  2. Cut overhanging branches.
  3. Not build houses on swamp lands.
  4. Not cut down trees without replanting.
  5. Make sure roofs, windows and doors are hurricane resistant.
  7. Not leave matches, lighters in reach of small children.
  8. Install smoke detectors and fire extinguishers in the home.
  9. Clean drains and gullies on a regular basis.
 10. Not dispose garbage in drains and gullies.
 11. Correct hazards.

- 100% of parents say that it is very necessary to be educated to disaster as it can happen anytime and we could be caught unprepared.

- Approximately 70% of parents said they felt more educated as to what to do during an earthquake. They would drop, hold on and cover. They would stay clear of power lines and trees.

- Although it would be presumptuous to give an overall exact figure or percentage from the data presented, it can still be concluded that a large number of parents interviewed feel now more educated about disaster mitigation as a result of participating in the initiative, and that they will act upon implementing at least some mitigating measures.
- These figures do demonstrate however that the "Developing a Culture of Disaster Mitigation through Education" initiative is definitely on target as to responding to a real need, which is educating people about mitigation.
- The results from the quiz given to the students at the end of the program based on the category they had more specifically studied were mixed. The 1st & 2nd graders only had a 53.3% accuracy, compared with 86.6% for the 3rd & 4th graders, and 70% for the 5th & 6th graders. It is difficult to draw conclusions from these figures and consider them very representative, especially due to the fact that each team was composed of only 6 students (36 altogether), for a total student population of 2,000. The relatively low scores from the 1st & 2nd graders could be explained by various factors. It could be that the children did not have enough time to assimilate the information provided (only 2 months), or that they are too young to grasp the concepts of mitigation. But like mentioned before, we cannot draw conclusions at this time.
- As a direct result of participating in the initiative and becoming more aware of mitigation measures, the school Club Scout underwent a clean up campaign for Independence Park on the Parish of Westmoreland. Thirty students, supervised by two teachers, participated in the clean up exercise in June 2002. During the activity, the teachers asked passers by to keep the park clean, and explanations about mitigation was provided. The park is now looking clean.
- Similar to this "corrected" behavior towards mitigating is another concrete example of the positive results of the initiative. When we started the initiative at the school early March 2002, recycling plastic bottles used to be kept in a back corner of the schoolyard, with no lid over the concrete container, and a stack of destroyed wooden chairs and tables were piled up nearby in the open air. The playfield was scattered with garbage items from the children's lunches. By the time we had the symposium "Mitigation in Action" early June 2002, all these potential flying debris in case of high winds had been cleared away.
- On the other hand, we also have one example where transforming knowledge into action did not take place. The last day of the "Mitigation in Action", a big storm with very heavy rains broke out. Due to inadequate gutter system, it took only about 45 minutes for one classroom to get flooded. Some teachers and students' first reaction was to say that "it always happened" and did not know what they could do to change the pattern. With the help of co-investigator Isabelle Simon, 3 teachers assessed what needed to be changed/added to the gutter system in order to avoid future floods of the school and new gutters will be installed and extended as well as trenches dug so that the water flows out to various areas rather than in one same spot. This incident illustrates perfectly that demonstrating a change of behavior has yet to come, and that the "culture" of mitigation cannot be built overnight but rather, will take time and perseverance and will require long term planning and repetitive education.
4. Workshop in Miami

- On September 16, 2002, a workshop was conducted at the Koven Center at the Florida International University in Miami. The purpose of the workshop was to present the work that had been done in our four pilot schools as well getting teachers from local schools interested in joining the initiative. Invited and present were mostly k-12 teachers from both Broward & Miami-Dade counties. Also present were the following:
  - Brock Long from the Federal Emergency Management Agency (FEMA)
  - Prof. Thomas-Hope from the University of the West Indies (UWI)-Mona, Jamaica
  - Donovan Gentles from the Caribbean Disaster Emergency Response Agency (CDERA)
  - Arthur-Oyola-Yemaiel from the Division of Emergency Management (DEM) at the Department of Community Affairs (DCA) of Florida
  - John Gabel from Broward County Emergency Management
  - Frank Reddish from Miami Dade County Emergency Management

- Principal investigators presented the rationale, objectives and key concepts of the "Developing a Culture of Disaster Mitigation through Education" initiative. The teachers in each participating schools presented the case study of their particular school.
- FEMA presented their CD-ROM program "Hurricane Strike" and gave each participant a free copy. Frank Reddish from Miami-Dade county emergency management presented what the county has been doing in terms of mitigation in the community since hurricane Andrew in 1992.
- Every attendee received draft copy of the "Developing a Culture of Mitigation through Education" project manual including lesson plans etc... as well as other resources on disaster mitigation for schools that they can use.
- CDERA, UWI, and DEM have all expressed support for the initiative and are interested in working closely with the core team.

5. Recommendations

5.1. For Savanna-la-Mar Primary School & Jamaica

Below is a list of recommendations at the school level, personal (home) level, and community level that the school identified after participating in the initiative:

**School**
1. Create another exit/entrance.
2. Put corridors and stairs on opposite sides of buildings.
3. Remove overhead shelves.


4. Have doors on either side of building for easy exit in case of an emergency.
5. Installation of smoke detector, fire extinguishers and fire bell.
6. Enlarge main entrance or exit for easier flow of children.
7. Frequent fire drill.
8. Frequent removal of garbage to prevent them from coming inside and blocking drains.
9. Adapt disaster mitigation in the schools curriculum for grades 1-11.
10. Establish meeting place in case of a natural phenomena.
11. Frequent earthquake drills (drop, cover and hold on).
12. Compulsory installation of lightning rods in the school.
13. Learn more about the do’s and don’ts for the different types of natural phenomena.
14. Continue with the training and infusion of mitigation issues in the curriculum

**Home**
1. Use safety latches on cupboard doors.
2. Frequent fire drill with family member.
3. Compulsory installation of fire safety devices in the home.
4. Identification of hazards in the home and find ways to reduce these hazards.
5. Talk more frequently about disaster preparedness.
6. Have disaster kit ready at all times and do not wait until disaster strikes.
7. Establish exit in case of a disaster.
8. Establish meeting point.

**Community**
1. Keep rivers, trenches and drains clean from garbage. Reinforcement of the anti litter act.
2. Cut overhanging branches near houses.
3. Educate the public more about disaster mitigation and preparedness.
4. Identification of hazards in the community and find ways to reduce them.
5. Take disaster mitigation and preparedness more seriously.
6. Frequent clean up community campaigns.
7. Proper disposal of garbage-Parish council to be more vigilant.
8. Check land before building-Approval done by parish council.
9. Extend initiative to other schools so that there can be a greater dissemination of information.
10. Adapt a reforestation program annually to prevent soil erosion.
11. Build retaining walls for roads near to gullies.
5.2. Overall

- During the training sessions of the lead teachers or consultants, their responsibilities as well as the deadlines they need to respect need to be well emphasized and made absolutely clear, so that there is no confusion as to what is expected, and the teamwork is not being delayed because of miscommunication.
- The training part of the consultant and the other teachers at each participating school needs to take place well before they start their activities in their classroom (summer), so that they have time to “digest” the new concepts before incorporating them into their lesson plans.
- The training should include explanation of the mitigation concept within the context of the cycle of disaster management (mitigation-preparedness-response-recovery) and practice exercises should be used to assess that consultants do understand the difference between “mitigation” and “preparedness”.
- Being still at the early stage of such an initiative, selecting a lead teacher who is technology inclined and computer literate should be a prerequisite, so that his/her work as well as communication between parties involved is made easier.
- In school where there is a 2-shift situation, have one consultant per shift in order to make it more manageable for the consultant.
- More schools need to participate in this initiative. The more we are out there “mitigating”, the more efficient we will be in reducing damage to our homes, schools, & ourselves.
- Collaboration is needed for the success and sustainability of such endeavor. From a bottom up approach (schools to leaders) needs to follow a top down approach (leaders to schools), which means that we need to attain official infusion of mitigation lessons in K-12 curriculum at national level + enforcement of mitigation regulations (i.e.: no littering, no dumping) in the community.
- A small seed has been planted. There is only so much (or so little) one or four schools can do in a 2-month span. We still have a long way to go.
- Transforming knowledge into action demonstrating a change of behavior has yet to come. In order to be truly effective in "Developing a Culture of Disaster Mitigation", mitigation issues need to be studied not just once, but throughout the K-12 level as part of the regular curriculum. Like mentioned before, behavior does not change overnight and needs perseverance.

5.3. Finishing Note

What it all comes down to is “changing our way of thinking, before a disaster changes our way of life” (Quote from Bob Bray, Planning Director for City of Pinellas Park. Recently supervised publication of a disaster mitigation manual entitled Preparing your Home before Disasters
Strike. Manual is free upon request, and provides clear and easy to follow mitigation measures for home owners)
APPENDIX A

Quiz On Fire and Weather (Grade 1 & 2)
1) What damage can fire do?
2) Name the community helpers who put out a fire?
3) Why is fire dangerous?
4) What can you use to put out a fire?
5) What can cause a fire?
6) How can we prevent fire?
7) What is the first thing you would do if your house was on fire?
8) Name the instrument used to measure how hot or cold the temperature is?
9) The hotness or coldness of the time is called?
10) If the temperature yesterday was 38 degree F and today it is 34 degree F, what is the difference between the two temperatures?
11) Describe the type of weather that we are experiencing at the moment?
12) Mr. Brown's house is on fire, whom should he call (The fire, police, security guard)
13) Which is the hottest temperature? (30 degree C, 35 degree C, 39 degree C)
14) Which is the coldest? (28 degree C, 33 degree C, 25 degree C)
15) The emergency number is (911, 119, 191)
16) How can we prevent fire?
17) Which room do you think fire would spread more quickly in (Closed room or Open room)
18) If your clothes are on fire, what should you do to put it out?
19) If the clouds are very dark gray, that means it is going to?
20) What is the best way to put out a fire caused by electricity?
   (Use of water, use of fire extinguishers, beat the fire)

Quiz on Flooding (Grades 3 & 4)
1) Which natural disaster is the most frequent and costly?
2) Which soil allows water to pass through the easiest?
3) Which soil allows little or no to pass through?
4) The washing away of soil is called?
5) How can we prevent soil erosion?
6) Which soil holds the most water?
7) Name the instrument used to measure wind speed?
8) A very strong fast wind is called?
9) Can we get back water when it evaporates?
10) When gullies are blocked so that water cannot flow freely, this can cause?
11) Who or what caused the blocking of drains?
12) Name two things that flood can cause?
13) Name one place where the washing away usually occurs?
14) Moving air is called?
15) Light wind is called?
16) What can moving air do?
17) Name the instrument that tells the direction from which wind is blowing?
18) Name two items that should be included in a disaster preparedness kit?
19) What is the meaning of ODPEM?

**Quiz On Hurricane and Earthquake (Grades 5 & 6)**

1) In which year was Port Royal destroyed by an earthquake? (1709, 1907, 1790)
2) The earth is made up of (three, four, two) layers.
3) Earthquake occurs in the (crust, mantle, core)
4) Tell one thing you should do before an earthquake?
5) Tell one thing you should do during an earthquake?
6) Tell one thing you should do after an earthquake?
7) What causes an earthquake?
8) What is the earthquake at sea called?
9) Which section of Jamaica is more vulnerable to earthquake
   (Northern, eastern, western)
10) Which two parishes had the least number of earthquake in 1999?
11) Smaller earthquakes that follow the main earthquake is called?
12) Most earthquake-related injuries result from (Collapsing structure, flying glass, falling objects, moving people)
13) Earthquakes are predictable and preventable. True or False
14) Earthquake damages are preventable. True or False
15) Name the instrument used to measure earthquake?

1) Give another name for a hurricane that originates in the western Pacific Ocean?
2) Give another name for a hurricane that originates in the Indian Ocean?
3) The calm center of the hurricane is called?
4) How many categories of hurricane do we have?
5) Which is the most dangerous category?
6) Name the hurricane that affected Jamaica in 1988?
7) Name the hurricane that affected Jamaica in 1952?
8) Name the instrument used to measure wind speed?
9) When is the hurricane season?
10) Most hurricanes that affect the Caribbean started in the (Pacific, Atlantic, Gulf of Mexico)
11) In which year did hurricane Andrew affected Florida?
12) Use one adjective to describe a hurricane?
13) Hurricane George is located at latitude at latitude 18 degree north and 78 degree west. Identify this country.
14) Name one item you would include in a disaster preparedness kit?
15) A strong fast moving wind is called?
Jamaica not ready for natural disasters – expert

Roy Sanford
Freelance Writer

Residents of Westmoreland should now have a better understanding of how to prepare for natural disasters following Tuesday’s staging of an exhibition and symposium on disaster preparedness at the Savannah-la-Mar Primary School.

The Savannah-la-Mar Primary School and the Centre of Disaster Management and Humanitarian Assistance at the Florida International University jointly staged the exhibition and symposium, which was staged under the theme, ‘Disaster Mitigation 2002’.

According to Salome Foster, the co-ordinator of the event, the primary aim of the symposium and exhibition was to teach residents of Westmoreland how to prepare for and to minimise damage during natural disasters.

“As we know, there are different types of disasters,” Mrs. Foster told The Gleaner, in an interview on Tuesday. “What we are trying to do is to help people identify the problems that are associated with each disaster and to minimise damage should these occur.”

The event attracted support from a wide cross-section of the Westmoreland community. Those who attended included representatives from the Office of Disaster Preparedness and Management (ODPEM), the Red Cross, the fire department, at least two insurance companies and residents of the parish.

During the symposium, students from the school performed a number of songs, dances and skits all relating to the theme of minimising damages during a disaster. They also displayed a number of model houses, which they themselves constructed.

Isabelle Simon, a representative from the Florida International University and an expert on disaster preparedness, said that based on her observations, the island is “very much unprepared” for a major natural disaster. Simon, who has instructed professionals from across the state of Florida on how to prepare for disasters and who has worked with the International Hurricane Centre in Miami, said that “prepare, prepare, prepare” should be the phrase in the face of an impending disaster. She added that she is hoping that the symposium and exhibition will expose people to the importance of preparedness in face of natural disasters.

“If we prepare, damage will be less,” she pointed out. “Unfortunately, we cannot prevent natural disasters but we can learn to prepare for them.” Ms. Simon said, emphatically. “For example, when threatened by a hurricane, people should start getting rid of garbage and debris since the number one cause of damage and casualty during a hurricane is flying debris.”

She added that another important aspect of disaster preparedness is the building of strong houses and roofs, especially in a hurricane-prone island like Jamaica.

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**Setting the Record Straight**

In reference to the article that was published in the Sunday Gleaner dated June 02, 2002 about Frame by Frame’s International awards, there was an unfortunate omission directly linking Grimax Advertising Ltd. to the Cresta Award that they received in 1998 for creating the campaign for American Airlines. The omission was certainly not intentional and Frame by Frame Production apologizes for any misunderstanding that may have occurred.