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Threat Appraisal and Community Efficacy towards volcanic eruption of Mount Nyiragongo in Democratic Republic of Congo

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Abstract :

Disaster management requires identifying "vulnerable » people before the occurrence of the hazard itself. In Kiziba village, an area located in Democratic Republic of Congo, this theory has never been effective yet people are exposed to volcanic eruptions and toxic gas release from the lake. In addition to that authors have qualified rural

community to be more vulnerable that urban communities due to isolation, less access to health care services (Juliet Hassard and Kevin Teoch, 2013). Seeing such vulnerable group exposed to a natural disaster shows a need for a particular attention. This study follows two specific objectives: to describe the threat appraisal of people towards volcanic eruption of Mount Nyigongo and to examine the current community efficacy to respond to the future eruption. The study design is descriptive and cross-sectional using qualitative and quantitative methods. 380 people (males and females) aged 18 to 77 years were selected for a household survey and 3 key informants for interviews. Majority of the respondents (96%) felt that a volcanic eruption poses a threat to their life, half of the respondents felt that the volcanic eruption is predictable therefore gives them time to prepare for an evacuation while the rest no. Results on perceived preparedness, half of the respondents said that they are not prepared to a potential eruption. The community efficacy in Kiziba village was found to be low. No neuro-psychiatric institution is involved in preparedness for volcanic eruption of Mount Nyiragongo. I recommend that researchers keep assessing the mental health status of people in all stages of disaster, the disaster management education (DME) to be introduced in schools in order to preventing under 18 stress and Post traumatic stress disorder due to volcanic eruption and use students as propagators to disseminate information about natural disasters at home and in the community.

Keywords: *Threat appraisal, community efficacy, natural disaster*

1. Introduction

1.1. Background Information

Scientists and clinicians have studied the effects of stress from natural disasters on survivors' psychological and physical health since the 1940s. They recognized that some people who have been exposed to various natural disasters could develop psychological injuries such as major depression, stress, chronic anxiety, and post-traumatic stress disorder. (Gunn, KM; Kettler, 2012)

Not all disasters are the same. Each disaster, whether a flood earthquake, hurricane, or human-caused event, has unique elements. These elements have psychological implications for survivors and communities and the potential for shaping and influencing the nature, intensity, and duration of post-disaster distress. (Mental Health Program and Pan American Health Organization, 2012)

Psychological impacts of disasters would also depend on other factors such as the social vulnerability. These impacts may occur before the event "pre-disaster phase", during the hazard itself and even after the occurrence of the event "post-disaster phase". (Eveline Favero, 2012)

When a disaster has a seasonal pattern, such as a hurricanes or tornado, survivors are concerned they will be hit again before the season ends. Earthquakes, volcanic eruptions, and floods that do not necessarily follow a seasonal pattern tend to make survivors anxious and preoccupied because the immediate probability of recurrence is perceived as high. (Mental Health Program and Pan American Health Organization, 2012)

That's why researchers emphasize that it is essential to organize locally appropriate mental health and psychosocial supports that promote self-help, coping and resilience among affected people.

On January 10, 1977, Nyiragongo erupted on its flanks generating 4 lava flows. The longest flow in the south stopped at 1.5km of Goma international airport. Officially 70 persons were killed by its fast lava flow. Several small villages such as Kiziba were destroyed by the flow including field. On January 17, 2002, Nyiragongo erupted again on its flank. It was reported

that 45 were killed by the lava flows on January 17 and 60 by the explosion of fuel tank on January 18. Based on field observations and satellite imageries, 13% of Goma were burned with nearly all properties and 80% of economic areas were destroyed by the lava flow. (Wafula, Yalire, Kasereka, Ciraba, & Kwetuenda, 2008)

Psychological stress from the eruption was considered by local doctors to be a much more significant health problem than injuries from the lava flows. As well as fear of the direct threats to life, the main problem for ten thousands of people was the complete destruction of their homes and all their possessions in lava flow, as well as the economic impact on community from loss of shops and trade in the devastated parts of the city. (Peter J Baxter, 2002)

It therefore becomes crucial to describe the current threat appraisal of the people and examine their collective efficacy towards Mount Nyiragongo eruption.

1.2. Problem Statement

Democratic Republic of Congo revised its disaster national plan in 2012 to improve the way of managing natural disasters recognizing that the latest Nyirangongo volcanic eruption affected millions of people.(Republique, 2012)

However, the cited plan doesn't define "vulnerability" nor does it give a mechanism to identify vulnerable people to a disaster from the general population. Yet it says, for instance, in pre-alarm stage, there must be evacuation of vulnerable people. (Dushime Dryscks, 2014; Republique, 2012) Actions taken are more likely to be ineffective or miss oriented due to this gap. The starting point could have been to clearly define "vulnerable people" for each and every disaster in the country before posing any kind of assistance.

Also, when they are describing effect of volcanic eruptions in specialized agencies reports, they are not giving information about the psychological health of people living in high risk areas before the occurrence of the hazard (Cambridge University Press, 2015; Peter J Baxter, 2002; Republique, 2012; Returns & Nfis, 2012). In disaster psychology literature they say that a natural disaster affects people's mental health before (warning period), during and after the disaster. (Eveline Favero, 2012)

Such information (baseline survey) could give us an idea about vulnerability to the disaster and to know the kind of assistance/ interventions (psychological, technical, medical, etc.) that is needed in disaster preparedness stage.

In response to this problem, we carried out an inclusive participatory investigation that shows data about the appraisal of rural communities and their community efficacy to respond to Mount Nyiragon go eruption.

1.3. Research Objectives

1.3.1. Broad Objective

To describe the threat appraisal and community efficacy of towards volcanic eruption of Mount Nyiragongo

1.3.2. Specific Objectives
- To describe the current threat appraisal of people towards volcanic eruption of Mount Nyiragongo;
- To examine the community efficacy.

1.4. Significance

The benefits of this study were expected in different dimensions. First of all it has filled the gap of poor scientific papers on human cognition in disaster preparedness phase by showing the current level of psychological stress of people living in Kiziba village. Finally, it will open ways to resilience projects in order to reduce psychological problems such as trauma and stress, it will also increase community self-reliance and therefore reduce the overall economic costs of natural disaster.

2. Materials and Methods

The study was descriptive cross-sectional using both quantitative and qualitative methodologies. Data was collected through administration of a questionnaire to household members in Kiziba village and interviews of key informants.This research was conducted in Kiziba village, located in the eastern part of Democratic Republic of Congo specifically in North-Kivu province.

2.1. Sampling Design

Purposive sampling was applied in selection of the study participant. According to Patton, the logic and power of purposeful sampling lies in selecting information-rich cases, which are those from which one can learn a great deal about issues of central importance to the purpose of the research. (Becker et al., 2011) These were assumed head of institutions involved in natural disasters for qualitative data.

For quantitative data, the village was divided into clusters that correspond to the estates. As global population of the village is 31561 people, the neighborhood that has more population will definitely have a big number of respondents based upon the sample size of the study.

2.2. Sample Size

The statistical Fisher's formula is used to get the sample size because the population with characteristic was unknown. (Israel, 1992)

n= (Zpq)d² for population greater than 10.000.(Israel, 1992; Jung, 2014)

n= 380

The sample size that came from this formula is 380 individuals for quantitative data.

2.3. Inclusion and Exclusion Criteria

`   This study will include:

• Both male and female 18-77 years old
• People living in Kiziba at least a year before the survey
• People without physical or mental disabilities

Respondents who correspond to these criteria will be excluded from our study.

10 enumerators were selected in clinical psychology of Université Libre des Pays de Grands Lacs (ULPGL). All enumerators were in their last year of bachelor's degree. This group was chosen due to their knowledge on mental health challenges as well as their experience in surveys involving human beings. The selection covered all students with stated criteria to avoid subjectivism. Enumerators were trained on the aim of the study, the questionnaire.

2.4. Ethical Consideration

To ensure ethical issues are adhered to in preparation and during the study, an approval from the research committee of the Great Lakes University of Kisumu (GLUK) were sought. The tool was then sent to Nyiragongo territory office in Democratic Republic of Congo to get "a go ahead" for data collection in Kiziba village.

We went also to see local authorities in Kiziba Health Center and to the Village Office in order to clarify issues and obtain their co-operation.Research assistants red the consent for the respondents who in return gave verbal consent before they begin the interviews.

2.5. Data Procedure

A tool was administered to 380 people with 18-77 years of age. It covered risk perception (threat appraisal).Data collection was conducted by independent and trained enumerators recruited in a local university (ULPGL), faculty of psychology to reduce bias.

Face to face interviews were conducted by trained enumerators for people with lower level of education (secondary incomplete and below) while for respondents with at least secondary complete level, we used a self-administered questionnaire approach. It's important to mention that even for self-administered approach; enumerators were moderating the filling of questionnaires. The questionnaire was made with five closed-ended questions written in French and sometimes translated in appropriate local languages for easier comprehension.-Volcanic perception (5 questions) with scale "Yes" and "No"

Before distributing the questionnaires, investigators introduced themselves to the object, explained the purpose of the research, guaranteed confidentiality and anonymity, asked consent, provided instructions on filling of the questionnaire, and answered the questions asked by participants. Then debrief was done on a daily basis with enumerators in order to clarify areas of confusion in the instrument and data collection procedures.

Key informant interviews provided qualitative data. These were carried out with adult men involved in disaster management in Democratic Republic of Congo. 6 key informants were targeted but we managed to interview 3 (a nurse, the vice- coordinator of civil protection in north Kivu province and the scientific director of Goma Volcanic observatory).

The key informant interview tool had five opened-ended items written in French and it was about the community efficacy (collective efficacy) towards volcanic eruption. All data collection was recorded on a hand-held digital device for verbatim transcription.

A copy of ethical review letter was requested to be submitted to the secretary office one day before the interview to get an approval through phone and set time for the face to face interview. Like for the survey, before starting the interview the principal investigator explained the purpose of the research, guaranteed confidentiality and anonymity, asked for consent, informed the object of the use of a hand-held digital device and answered questions of respondents.

2.6. Data Processing and Analysis

Manual data cleaning was first undertaken to verify the number of questionnaire from each cluster. The screen for data entry was set and measures of scale assigned for variables before data entry. Three hundred and eighty questionnaires were entered in the computer using SPSS v16.0 for windows.

For qualitative data, an inductive qualitative approach was used to perform content analysis on the data. Qualitative content analysis focuses on characteristics of language as communication, with attention to the content or contextual meaning text. The researcher conducted the coding process with independently codes descriptions, line-by-line reading of all descriptions, comparison of incidents for similarities and differences to develop matrices, which were used to compare the

emerging categories. The factors with similar meanings were then combined to yield abstract themes. Therefore 3 themes were maintained.

The process of analysis and interpretation involved disciplined study, creative insight and careful attention to the purposes of the study. However, in qualitative research there is typically no precise point at which data collection ends and analysis begins

3. Results

In this chapter the researcher presents the results on psychological status of people towards volcanic eruption and gas release in pre-disaster phase in Kiziba village, Democratic Republic of Congo. The researcher starts by describing the context in which the study was conducted, providing a brief demographic description of participants of the study and sketching the context. The researcher then goes on to discuss the practical issues related to the implementation of the study. This ends by presentation of findings.

Subject's Location					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bishusha 1	60	15.8	15.8	15.8
	Bishusha 2	65	17.1	17.1	32.9
	Hewabora	51	13.4	13.4	46.3
	Kashongo	32	8.4	8.4	54.7
	Matovu	35	9.2	9.2	63.9
	Munanira	100	26.3	26.3	90.3
	Pole-Pole	37	9.7	9.7	100.0
	Total	380	100.0	100.0	

Table 1: Location

Data were collected purposively in seven estates in Kiziba village (Bishusha1, Bishusha2, HewaBora, Kashongo, Matovu, Munanira and Polepole) out of the 13 existed. Munanira had the highest respondents or 26.3% and Polepole was the last estate in terms of respondents with 9.7%.

Independent variables	Total population (N=380)	
	Frequency (N)	Percent (%)
Gender	n (380)	
Male	184	48.4
Female	196	51.6
Age	n (380)	
18-24	94	24.7
25-39	137	36.1
40-49	78	20.5
50-59	52	13.7
60-77	19	5.0
Marital Status	n (380)	
Married	232	61.1
Married (Polygamy)	14	3.7
Widow	20	5.3
Widower	14	3.7
Single	100	26.3
Relationship with head of Household	n (380)	
Head of household	134	35.3
Spouse	142	37.4
Child by birth	49	12.9
Grand child	21	5.5
Child by relation	30	7.9
House help	1	3
Other	3	8

Independent variables	Total population (N=380)	
	Frequency (N)	**Percent (%)**
Level of education	n (380)	
None	70	18.4
Primary incomplete	61	16.1
Primary complete	83	21.8
Secondary complete	123	32.4
Post-secondary school	43	11.3
Counseling session	n (380)	
None	258	67.9
Individual counseling	74	19.5
Group counseling	48	12.6
Source of Income	n (380)	
Agriculture	147	38.7
Business	112	29.5
Employment	54	14.2
Other	67	17.6

Table 2: Total Population Frequency and Percentage of Independent Variables

Gender: In our sample, females were many compare to males. They were 196 or 51.6% while men were 184 or 48%.
Age: When comes to age almost half of the respondents or 36.1% were 25-39 years of age followed by youth (18-24) with 24.7%, then 40-49 with 20.5% and 50-59 with 13.7%. Lastly, elders (60-77) were only 5.0% of the respondents.
Marital status: More the half or 60.1% of the respondents were married to one partner followed by single who were 26.3% then widow with 5.3%. Lastly, polygamous were 3.7% of the respondents and widower 3.7%.

Relationship with the head of household: 37.4% of our respondents were spouses, 35.3% were head of household, 12.9% were child by birth, 7.9% were child by relation, 8% of the respondents had other relationship with the head of the household (friends, colleagues,…) and only one respondent (3%) was a house help.
Level of Education: A big number of the respondents or 32.4% have completed their secondary school followed by 21.8% who completed their primary school then 18.4% who didn't go to school and 16.1 who did not complete their primary school. Only 43 respondents or 11.3% went to university.

Counseling session: More than half or 67.9% of the respondents have never gone for a counseling session while 19.5% have done an individual counseling and 12.6% went for a group counseling.
Source of Income: More than half of the respondents (147) or 38.7% while 29.5% are doing business, 14.2% are employed and 17.6 are doing informal work.

Volcanic Threat Appraisal		
Variable	Frequency	Percent (%)
Threat to life	N (380)	
Yes	363	95.6
No	17	4.5
Threat to health	n (380)	
Yes	349	91.8
No	31	8.2
Perceived damage	n (380)	
Yes	371	97.7
No	9	2.1
Predictability	N(380)	
Yes	189	49.7
No	191	50.3
Perceived preparedness	n (380	
Yes	192	50.5
No	188	49.5

Table 3: Volcanic threat appraisal versus gas explosion threat appraisal

Threat to life: Majority of the respondents or 95.6% said that volcanic eruption poses a threat to their life.
Perceived damage: When comes to perceived damage, a big majority of people (97.7%) said that a volcano eruption can destroy all their property.

Predictability: Half of the respondents (49.7%) said that they can predict a volcano eruption.
Perceived preparedness: Slightly more than half of the respondents (50.5%) said that they are prepared for the next volcano eruption.

3.1. Qualitative Data

3.1.1. To Describe the Community Efficacy towards Volcanic Eruption

For qualitative data we used 3 opened-ended questions to describe the community efficacy.
The information was gathered through interviews which were anonymized and transcribed. The transcripts were read and re-read to extract themes relevant to the research questions and get familiar with data. The researcher coded all the data and then identified emerging themes categories. The researcher then made a list of master themes and produced a table of consolidated themes and sub-themes for the group of participants.

Theme N°	Theme Name	Related sub-themes
1	Reactions of the people during pre-alarm information dissemination upon Nyiragongo volcano	Panic
		Modification of the information
2	Cases affected by volcanic	-
3	Preparedness of Kiziba community	Availability of a contingency plan and evacuation plan
		Availability of community advisors
		Production of a weekly news letter
		Insufficiency of information equipment among the community

Table 4: Themes and Sub-Themes

3.1.2. Reaction Of The People During Pre-Alarm Information Dissemination Upon Nyiragongo Volcano

When there is an abnormal phenomenon in the flank of Nyiragongo volcano, GOV (an institution in charge of volcanic surveillance) normally inform local authorities and the population through media.
Panic

The release of volcanic related information brings panic among the population. It is believed that this panic comes to the fact that majority of the population experienced latest Nyiragongo volcanic eruption that killed people and livestock, destructed houses and properties and relocated about 140 000 people from their homeland. Others who joined the village later always get testimonies of the tragedy from senior residents. Basically the panic is more observed among people who got the information by rumors (indirectly) and it reduces when specialized agencies tell them that the threat is not immediate.

3.1.3. Modification of the Information

This refers to the fact that people in the community normally disseminate the information in the manner to overestimate the risk.

"When the population hears that there is an abnormal phenomenon in the volcano, everyone has his own way of perceiving this. People normally think that authorities are not telling them the truth and that the risk is more significant than what is said. I think they still have memories of what happened in 2002 during the previous eruption. That time the whole province was governed by rebels and when we were alerting them over a potential volcanic eruption, they were not taking the risk seriously. Some of the authorities were even going to radios and contradicting information that we gave and this put the whole population into confusion. And I believe that's why people were more affected that time because they didn't have time to prepare themselves against the risk. Basically what we do after observing such rumors, we give a message through media in two languages: French and Kiswahili. Also we encourage people to come in the office anytime they have questions if they want to get information upon the trend of volcanic activities". (Scientific Director of Goma Volcano Observ atory)

"Kiziba village as it's a rural area, majority of people stopped their studies after primary school and some did not even go to school. This shows that their level of understanding is low. Now when authorities are talking about an abnormal phenomenon or an intense activity in the flank of Nyiragongo, people start telling their friends and neighbors that eruption has started and those authorities are just laying to them. Definitely, this brings panic in people" (Nurse of Kiziba Health Center)

3.1.4. Cases Affected By Volcanic Information

This theme is about knowing whether the village has recorded any case of people affected mentally due to fear of a volcanic eruption or gas explosion especially during dissemination of pre-alert information.
And here all the respondents said that no case was reported so far by institutions involved in disaster management in this area.

"In the health center we receive people who come to seek services and so far no one has reported such health problem. After those periods of rumors surrounding the village, we have never gone to household and assess people's mental health. Such information can be found directly in the household." (Nurse in Kiziba Health Center)

3.1.4. Preparedness of Kiziba Community
This theme describes the coping capabilities of Kiziba community for the future (potential) volcanic eruption or gas explosion from Lake Kivu.

3.1.5. Availability of a contingency plan and Evacuation plan
"To strengthen the resilience of the community, there is a contingency plan that has scenarios of disaster (from minor to the worst) and how the population can behave in each scenario. We also came up recently with an evacuation plan to know for instance in case of a volcanic eruption, the directions to follow and where to go. Like for Kiziba village, they will follow Sake road. And also we identified the relocation sites. All these were done with the blessings of the international community and other partners. What I can mention as a challenge to this plan is that roads are not opened. As the population of Kiziba is approximately 10 000, some roads cannot feat such a number with their thing (bicycle, motobicycle) during the evacuation process. Much has to be done to tarmac these evacuation roads, prepare simulation exercises to assess the effectiveness of the evacuation plan." (Vice-coordinator of Civil Protection)

3.1.6. Availability of Community Advisors
There is an availability of people whose duties are to educate the community on good practices during and before a disaster. Thirty are currently on duty for the region and they normally go to school, meet stakeholders in the village such as churches authorities, chief, elders. Schools were targeted because they assumed that I can be an effective way of disseminating the information. However, sensitization has not reached the household level due to poor resources.
Production of weekly newsletter
The surveillance of the volcano is the duty of Goma volcano Observatory. That's why on a weekly basis, they produce a report on the trend of volcanic activities communicated through radios. This is to help the community to improve knowledge on risk to which they are exposed but also it helps to reduce uncertainty and confusions.
Insufficiency of information equipment among the community
"The first challenge to preparedness is that in Kiziba there is no electricity to enable people to watch live news about volcanic activities and other orientations. Three out of ten people may even have radio to listen to new instructions set for disaster preparedness. And the more they don't have such communication devices the less they are prepared for the next volcanic eruption or gas explosion. This really makes them to be vulnerable compare to urban communities therefore people just rely on rumors as source of information" (Nurse in Kiziba Health Center)

Mental health is a new field in Congo and up to now there is a lot to do. People are not aware of how it works and therefore they don't know the worthy of it. Culture is also another barrier to our job. For instance, when someone has hallucination, people prefer to take the case to church or to the witch believing that such reaction is due to magic power. Even data about psychological problems during the latest Nyiragongo irruption (2002) produced by heal Africa Hospital are in doubt. Because that time, there was no clinical psychologist therefore they shouldn't have been be able to develop an appropriate scale for stress assessment. In DRC, the department of clinical psychology was established in 2003 and the first counselors in Health Africa Hospital came in 2012. Psychologists are not involved in disaster management at all. We have never received any call to prepare the community psychologically for the future eruption. Basically we are called by local NGOs to support victims of war and political conflicts. (Dr. Jacques Batenga, clinical psychologist at Heal Africa Hospital)

Figure 1: Story Tell of a Clinical Psychologist

4. Discussion
In the literature, self-efficacy tends to be a better predictable factor of stress rather than risk perception especially in studies about preparedness for terrorism attack. One study (n=3300, response rate 35%) adapted a model from PMT, focusing on risk perception and preparedness for terrorism. This study reported that risk perception did not directly predict preparedness for terrorism. The relationship between risk perception and preparedness of acts of terrorism was mediated by knowledge, perceived efficacy and milling behavior.(Luche Tadesse Ejeta, Ali Ardalan, 2015)There is no relationship between risk perception (threat appraisal) and self-efficacy. Albert Bandura is mentioned in many papers relating to self-efficacy.

4.1. Perceived Lost
This study found out that a big majority of the respondents (96%) felt that volcanic eruption poses a threat to their lives as well as to the life of their friends and family.
A similar study done in an early eruptive period of Mount st Helens in the USA found almost the same result. They conducted telephone interviews during April 5-7, 1980 with 173 (76 percent) of 228 subjects randomly selected from seven

communities along the Lewis and Cowlitz Rivers within a 40 mile radius of Mount St. Helens. Fifty-one (29 percent) respondents felt that it was likely that volcanic activity would threaten their personal safety or property.(James H. Shore, Ellie L. Tatum, 1986)

4.2. Perceived Damage

In the United States, they studied victims' attribution of causality and perception of lack of control two months post-eruption. They evaluated the self-report to questionnaires from 900 households in Eastern Oregon during the summer of 1980. While 78 per cent of their subjects indicated a feeling of internal control, 44 per cent felt unable to protect themselves from the ash fallout.(James H. Shore, Ellie L. Tatum, 1986)In this study, When comes to perceived damage, a big majority of people (97.7%) said that a volcano eruption can destroy all their property compare to a gas explosion where more than half (66.7%) said that it has also an ability of property destruction.

4.3. Perceived Preparedness

Roberts, Dillman, and Mitchell22 studied victims' attribution of causality and perception of lack of control two months post-eruption. This study also found that forty-six per cent had made no preparation for evacuation. Those who did make evacuation plans lived in closer proximity to the volcano. In our study, slightly more than half of the respondents (50.5%) said that they are prepared for the next volcano eruption. (James H. Shore, Ellie L. Tatum, 1986)The perceived preparedness, half of the respondents were prepared for both volcanic eruption and gas explosion.

4.4. Community Efficacy

Kiziba community has a low collective efficacy in that there are always panic, worry and modification of the information when they publish pre-alarm information. And this is due to insufficiency of information equipment whereby 6 out of 10 have even a radio to listen to new instructions and also due to illiteracy. In fact, 56% of our respondents did not reach a secondary level of education.

5. Conclusion and Recommendation

This study has indeed shown the threat appraisal towards volcanic eruption of mount Nyiragongo and the current community efficacy in Kiziba village, Democratic Republic of Congo. The study was done in a pre-disaster phase (before the occurrence of the hazard). It has also clearly demonstrated the relevance of a psychological preparedness as mechanism to strengthen the coping abilities of the people, reduce their vulnerability during the disaster and shorten the recovery period in the post-disaster phase (after the disaster).

In the perceived predictability, half of the respondents are able to predict the occurrence of a volcanic eruption. This joins the results from the key informant interview that stated "despite the availability of 30 community advices who are there to raise the awareness of the community about the disasters they are exposed to, this team has not reach the household level. to behave. The indicator on preparedness at a community level showed that Kiziba community is not psychologically prepared for the future disaster at all. No neuro-psychiatric center is involved in preparedness to the volcanic eruption or a gas explosion disaster. And even the organizational preparedness made in place like availability of an evacuation and contingency plan or community advisers is more theoretical. They are still sensitizing people in public places like schools, chef camp, churches,…" We emphasize that the availability of communities advises at the household level would definitely increase the predictability of the people because all the population will be reached and they will have right information about the disaster and it's likely to behave.

I recommend that researchers keep assessing the mental health status of people in all stages of disaster, the disaster management education (DME) to be introduced in schools in order to preventing under 18 stress and Post traumatic stress disorder due to volcanic eruption and use students as propagators to disseminate information about natural disasters at home and in the community. We also recommend the government to come up with an intervention of psychosocial support for disasters. The psychosocial support will be of a great help for the community during the warning period and in the evacuation process. It will be based on spreading regularly information in radio and public places on the volcano and the potential risks and also to bring psychologists expert in the household level to give counseling and educate people how to control fear and to make critical decision despite the panic during and volcanic eruption or gas explosion.

6. Scope and Study Limitation

The study put in consideration three aspects when talks of threat appraisal: perceived threat to life, perceived damage, perceived predictability and perceived preparedness. Data on the community efficacy were not collected on the household level instead chair of institution involved in disaster management in Kiziba village were interviewed. This included the scientific director of Goma Volcano Observatory, the vice-chair of civil protection in North-Kivu and the nurse of Kiziba health center.A part from French and English papers, other literatures are found as limitation of this study.

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