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A Study On Business Sector Preparedness In Disaster Management With Reference To Kerala State

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Abstract
Whatever be the type of disaster, business sector is the most impacted sector among the possible vulnerable parties, when considering the importance of contribution provided by this sector towards the national income. Therefore, this study focuses on identification of major natural and technology related hazards faced by businesses in Kerala. It also analyses existing contingency plans of businesses. The study attempts to assess whether the business firms are prepared enough to manage disasters which they have to face during their business operations. A thorough attempt is made to analyse the key success factors for businesses to manage such disastrous situations. As a rule, there should be a provision for preventing or facing unexpected disasters and the Management needs to keep a provision through their disaster management plan. Neverthless, the real implementation of it remains as a question mark still Therefore, the study seeks to evaluate the methods of disaster management taken up by some selected business firms. Data have been collected from the experiences of prior disaster situations and their measures adopted to mitigate the negative effects of them. The study has been limited to the Kerala State. Some specific areas of the state affected by various kinds of disasters during the last few years have been selected for the study.

Keywords: Disaster, Disaster management, Business Sector, Man made disasters

Introduction
Disasters, whether natural or anthropogenic, are sudden adverse unfortunate extreme events or hazards which cause greater damage to human beings as well as plants and animals. Disasters occur rapidly, instantaneously and indiscriminately. Disaster management is a complex multidisciplinary approach to tackle the pre and after effects of a disaster which occurs in a particular area or a region. In fact, comprehensive disaster management planning consists of 2 major components of pre disaster components having 3 aspects. Eg: Disaster preparedness, Mitigation and Disaster prevention and Post disaster component of disaster response. All over the world, both types of disasters were reported during the recent past. To effectively face the challenge of disasters, community needs to be ready for such situations with proper understanding. Natural disasters were increased due to the imbalance of the natural environment where in some cases it is indirectly related to the human caused activities. Technological crisis also increased with parallel to the more use of technology as a result of the development of technology. Obviously disasters cannot be stopped as most of the causes for such disasters are beyond the control of human. So that, the damages due to those disasters are unable to eliminate,

but will manage the possible disaster situations or mitigate the losses due to damages. Therefore, the Disaster Management is considered as a critical subject area in every aspects of modern society.

Objectives

a. To examine whether the manufacturing firms are prepared enough to manage disasters

b. To identify major natural and manmade disasters faced by manufacturing firms in Kerala and the existing disaster management plans of businesses

Hypothesis

- There is no significant relationship between business sector preparedness and man made disasters
- There is significant relationship between business sector preparedness and man made disasters

Statement of the problem

Recently, the intensity and frequency of natural and man-made disasters in Kerala have been much greater than before. Other disasters cause much negative impacts on the manufacturing companies of state of Kerala. Many business firms in the state resort to certain disaster management measures. Yet, it has to be realized how much effective and efficient are the existing measures. The present study focus on only certain worst affected districts and only some of the business firms in these districts. The data collected in this manner have been analyzed.

Research Methodology

Research Design: The study has adopted a Descriptive and Analytical Research Design so as to gather relevant knowledge on business sector preparedness in Disaster Management

Sample Design: In order to determine an appropriate sampling technique, it is necessary to identify the population and the sample in the context of our study. We have chosen manufacturing firms in Kerala to be our population. We have chosen a sample of 100 manufacturing firms, a part of the population that is to be examined, which we believe is adequate to represent the whole population.

Sample Techniques: We have applied Convenient Sampling Method. The questionnaire was given to 100 respondents.

Data Collection: Primary data is collected through survey method. Survey was conducted using well-structured questionnaire. The secondary data was collected from journals, magazines, publications, reports, books, dailies, periodicals, articles, research papers, website, manuals and booklets.

Framework of Analysis: The primary objective of the study was to understand the business sector preparedness in disaster management with reference to Kerala state. The respondents were asked to give their opinions on business sector preparedness in disaster management. A pilot study was conducted in order to validate the questionnaire and to confirm the feasibility of the study.

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Tools of Analysis: Tools used for the purpose of this study are mathematical and statistical such as percentages, graphs, etc. for the purpose of analysis and interpretation. Primary data was collected and analyzed using the SPSS.

Theoretical Background

Disaster Management

Disaster Management is primarily concerned with the steps taken by an organization or a country in response to unexpected sudden or anticipated extreme events to provide quick rescue and relief facilitates and to initiate steps for disaster recovery and rehabilitation.

Types of Disasters

Disasters are normally divided into two broad categories:

a) Natural Disasters

When disasters occur due to natural forces they are called natural disasters, over which man has hardly any control. Some common natural disasters are earthquakes, landslides floods, droughts, cyclones, etc. Tsunamis, volcanic eruptions and wildfires are also included under natural disasters. These disasters cause enormous loss to life and property.

b) Man made Disaster

When the disasters are due to carelessness of human or mishandling of dangerous equipment's they are called man-made disasters. Common examples of these disasters are train accidents, aero plane crashes, collapse of buildings, bridges, mines, tunnels, etc. The disasters are in the form of accidents, which occur all of a sudden and take a huge toll on life and property. Mostly such disasters cause injuries, diseases and casualties where they occur.

Man-made disasters are mainly of two types:

- **Local disasters:**

  These are small-scale disasters such as train accidents, plane crashes and shipwrecks.

- **Industrial and technological disasters:**

  These are much larger in scale and are the result of technology failures or industrial accidents. Such disasters affect both local population and may even cover a much larger area. Industrial disasters result due to accidental leakage of water or air pollutants. Many of the chemicals are extremely toxic and carcinogenic which affect the human population in an adverse way. Some people die instantly while others are crippled for whole life in the form of blindness, paralysis and many other chronic diseases.

Impact on the environment:

Leakage of toxic chemicals from the industries and accidents in the nuclear reactors has short-term and long-term effects on the environment and human health. Short-term effects on human health relate to casualties and diseases like blindness, cancer, paralysis, heart trouble, gastric and respiratory abnormalities. Long-term effects include genetic imbalances in humans and its impact on the future generations. Soil and water sources also remain polluted for long durations of time.

Prevention, control and mitigation:

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Man-made disasters can be minimized to a large extent by adopting the following measures:

1. Proper training of personnel working in the hazardous industries.
2. Proper maintenance and care of safety measures.
3. Removing human encroachments around hazardous industries.
4. Making the people aware about the first-aid methods in case of accidents.
5. Applying wet cloth over the mouth and nose in case of gas leakages minimizes the health hazards.
6. Remaining indoors in case of radioactive accidents.
7. Providing the people with proper medical care, in some cases throughout their life.
8. Providing adequate compensation to the affected people by way of money and employment.

Phases of Disaster Management

A. Mitigation

Mitigation involves steps to reduce vulnerability to disaster impacts such as injuries and loss of life and property. This might involve changes in local building codes to fortify buildings; revised zoning and land use management; strengthening of public infrastructure; and other efforts to make the community more resilient to a catastrophic event.

B. Preparedness

Preparedness focuses on understanding how a disaster might impact the community and how education, outreach and training can build capacity to respond to and recover from a disaster. This may include engaging the business community, pre-disaster strategic planning, and other logistical readiness activities. The disaster preparedness activities guide provides more information on how to better prepare an organization and the business community for a disaster.

C. Response

Response addresses immediate threats presented by the disaster, including saving lives, meeting humanitarian needs (food, shelter, clothing, public health and safety), cleanup, damage assessment, and the start of resource distribution. As the response period progresses, focus shifts from dealing with immediate emergency issues to conducting repairs, restoring utilities, establishing operations for public services (including permitting), and finishing the cleanup process.

D. Recovery

Recovery is the fourth phase of disaster and is the restoration of all aspects of the disaster's impact on a community and the return of the local economy to some sense of normalcy. By this time, the impacted region has achieved a degree of physical, environmental, economic and social stability.

The recovery phase of disaster can be broken into two periods. The short-term phase typically lasts from six months to at least one year and involves delivering immediate services to businesses. The long-term phase, which can range up to decades, requires thoughtful strategic planning and action to address more serious or permanent impacts of a disaster. Investment in economic development capacity building becomes essential to foster economic diversification, attain new resources, build new partnerships and implement effective recovery strategies and tactics. Communities must access and deploy a range of public and private resources to enable long-term economic recovery.

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Disaster Management Authorities

1. National Disaster Management Authority

Emergence of an organization is always through an evolutionary process. NDMA has also gone through the same stages. The Government of India (GOI), in recognition of the importance of Disaster Management as a national priority, set up a High-Powered Committee (HPC) in August 1999 and a National Committee after the Gujarat earthquake, for making recommendations on the preparation of Disaster Management plans and suggesting effective mitigation mechanisms. The Tenth Five-Year Plan document also had, for the first time, a detailed chapter on Disaster Management. The Twelfth Finance Commission was also mandated to review the financial arrangements for Disaster Management. On 23 December 2005, the Government of India enacted the Disaster Management Act, which envisaged the creation of National Disaster Management Authority (NDMA), headed by the Prime Minister, and State Disaster Management Authorities (SDMAs) headed by respective Chief Ministers, to spearhead and implement a holistic and integrated approach to Disaster Management in India. The National Disaster Management Authority (NDMA), headed by the Prime Minister of India, is the apex body for Disaster Management in India. Setting up of NDMA and the creation of an enabling environment for institutional mechanisms at the State and District levels is mandated by the Disaster Management Act, 2005. India envisions the development of an ethos of Prevention, Mitigation and Preparedness. The Indian government strives to promote a national resolve to mitigate the damage and destruction caused by natural and man-made disasters, through sustained and collective efforts of all Government agencies, Non-Governmental Organizations and People's participation. This is planned to be accomplished by adopting a Technology-Driven, Pro-Active, Multi-Hazard and Multi-Sectoral strategy for building a Safer, Disaster Resilient and Dynamic India.

2. Kerala State Disaster Management Authority

State Disaster Management Authorities are statutory bodies constituted under the Disaster Management Act, 2005 (Central Act 53 of 2005). Kerala State Disaster Management Authority is a statutory non-autonomous body under the Chairmanship of the Chief Minister of Kerala.

Recent Disasters occurred in Manufacturing firms of Kerala

Frequent disasters, natural or man made cause much terrible impact on the business sector on the state of Kerala. Some such incidents are given below:

1. Rahman Bazar, Kozhikode

On 28th December 2021, a horrible fire broke out in a footwear manufacturing factory at Rahman Bazar in Kozhikode's Kolathara. The employees came to know about it by 2am. At that time, only migrant workers were present there. Fire and Rescue units from Kozhikode and Malappuram districts together managed to put out the fore only by 6am. No emergency measures were available in the factory. Also, the fire force entered the building after breaking the wall with an excavator. The intensity of fire was very huge because of the presence of raw materials and chemicals used in the manufacturing of shoes. Six fire units struggled hard for around four hours

to extinguish the fire. Fortunately, the dreams filled with fuels for footwearing manufacturing processes did not catch fire. This averted a very big calamity. The cause of the fire is still unknown. This types of disasters could have been prevented if proper precautions had been taken in time.

2. Orion Chemicals, Ernakulam

A massive fire broke out Edayar industrial belt in Ernakulam at midnight recently. The fire broke out in Orion Chemicals, an Organic solvent factory and it soon spread to the nearby rubber processing factory. Luckly, no casulaties occurred. Edayar industrial belt is a region along the periyar river near Eloor. Hundreds of industries are housed in that area. From the visuals of social media, it could be seen that dense smoke was emanating from the factories. In one of the videos, a gigantic ball of fire could be seen rising up from a factory. Around 30 fire fighters from various fire and rescue stations in the district reached and struggled for more than two hours to bring the fire under control. Three workers inside the chemical factory during the accident had runout on spotting the fire. The exact reason for the fire is yet unknown. The police guessed that it might have been sparkled by lightning. Some people of locality also shared the same view. “The chemical factory had inflammable solvents and it is assumed that is why a major miscap occurred” said a police officer. This tragedy could also have been avoided if proper precautions had been taken in time.

3. Hindusthan Insecticides Limited factory at Eloor

On 6th July 2004, at around 2am a massive fire broke out in the Hindusthan Insecticides Limited factory at Eloor. Toxic gases and smoke spreads allover Eloor, Pallipurachal and Chowka North end as well as to the Varapuzha Panchayath area hurting thousands of people. People from pallupurachal area rushed to the Eloor ferry and crossed the river in fright and helplessness. Numerous helpless people were running with small babies to escape from the toxic smoke. The HIL management declared that the palnt was not badly affected and that only a small quantity of toluence, a little bit of endosulfan and some rubbersheets were burnt. Whatever the company say, the inhabitants of the area are still suffering serious health problems. A team comprising of 8 doctors assessed the situation and give immediate medical help under the additional District Magistrate, who was the first offici\4354fficeisit the site. He too could reach there around 8 hours after the incident. More than 200 people were given initial medical assistance. A 16 year old girl developed convulsions, chest pain and dizziness. So many similar were also reported. So, it can be inferred that a lot of longterm health problems would arise in days ahead. The Eloor industrial area houses about 250 industries. There are a dozen large chemical factories. The Hindusthan Insecticides Limited has always been a disaster prone plot. In 1999, green peace surveyed and sampled the factory outskirts especially a stram coming out of the factoryinto the community water body and it as found that chemicals were present in the stream. 39 of those chemicals were hazardous organo chlorine compounds including DDT and metabolites, endosulfan and metabolites and their degradation products. This factory is the only one plant in Indiawhich produces DDT (a persistent organic pollutant) and endosulfan and dicofol. The Green peace again conducted a study in the area in 2003. Then, it was found that the people living there were badly affected and that the probabilities of falling ill with various diseases were much higher than normal control values.

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DATA ANALYSIS & INTERPRETATION

CORRELATION			
	Insured Loss	**Employees**	**Assets**
Insured Loss	1		
Employees	0.830486645	1	
Assets	0.870362233	0.804343442	1

REGRESSION ANALYSIS

SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.897613
R Square	0.805709
Adjusted R Square	0.801575
Standard Error	187265.1
Observations	120

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	67530.15729	26322.13655	2.565527	0.011884
X Variable 1	2.545422995	0.527226222	4.827952	5.33E-06
X Variable 2	0.313307125	0.041821809	7.491477	3.67E-11

Interpretation

From the above results from regression and correlation analysis, it is clear that business sector preparedness and man made disasters has a significant relation between each of them.
From the correlation analysis, we can understand how strongly the variables are correlated.
From the regression analysis, we consider the size of business such as Total employees and Assets as independent variables and Insured loss as dependent variables. So here there is a significant relationship between size of business and Insured loss(Man Made Disaster) ie, (<0.05).

Findings

Business Sector Preparedness shows size of business and Man Made Disaster shows Insured Loss

- Size of the business is the strongest predictor of business disaster preparedness and smaller businesses usually have lower level of preparedness due to the lack of staff and time to engage in emergency preparedness activities.

- Business has an emergency plan mainly depends on its size and financial factors, so large businesses are more likely to have emergency plans than smaller ones.

Conclusion

This study mainly covers precautionary action against natural and man made disasters. Kerala state faces both natural and man made disasters. Large manufacturing firms have strong emergency plan than smaller manufacturing firms. Thus, it will make suggestions to contribute for possible intervention by universities and other related institutions for mitigating technology related disasters, that will contribute the corporate social responsibility(Adikaram & Nawarathna, 2018).

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