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Competence Building for Sustainable Post Catastrophe Waste Management

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Abstract:

Catastrophe's, both natural and human-made, have been taking place with escalating rate of recurrence and consequence in current decades in numerous realm's all around the globe. Among them, India is yet to recover from recent calamity that happened in Utrakhand in 2013. In the midst of many other reasons it has been acknowledged that lack of wakefulness of the instruments and systems for post adversity waste management is a vital question of apprehension. None of the Indian academic institutions associated to the field offer courses designed for the management of catastrophe waste within the nation. Moreover, none of these institutions demeanour awareness programmes intended at the public on new mechanisms and systems of management of disaster waste. To attend to these issues, these investigate aims to augment capacities to build up new apparatus and systems for sustainable post catastrophe waste management spotlighting construction and demolition waste. To achieve India and a framework will be proposed for enhancing capacities for sustainable disaster waste management in economical, social and technological aspects. This piece of writing is observatory in nature.

Keywords: *Post catastrophe management, Waste management, Construction and demolition waste.*

1. Introduction

Disasters cause considerable harm around the globe each year. There has been a boost in natural disasters over the precedent years and their collision in terms of human being, structural and monetary fatalities has also augmented significantly. Apart from the catastrophic price in lives it smashed and dented buildings and other infrastructure including building contents, even where buildings were not physically damaged it damaged vegetation at or in close proximity to coastlines.

According to the European Commission - a input player in post catastrophe compassionate aid processes – the key issues that necessitate to be addressed after urgent situation relief are: the conception of a establishment for sustainable and long term reconstruction and the inauguration of governance structures and projects in significant areas of recuperation, recreating communities and livelihoods, rehabilitation of the surroundings including waste management, rebuilding infrastructure and transportation processes, and strengthening local governance.

Therefore, it is obvious that effectual waste management strategies and strengthening local governance in correlated aspects subsequent to a disaster is emerging as an imperative region of thoughtfulness.

2. Research Problem

Together natural calamities and conflicts repeatedly result in spoil beyond monetary revamp of huge quantities of building stock and infrastructure facilities requiring demolition with the succeeding exclusion of debris. The demolition of ruins and the reconstruction of buildings create further construction waste. Unintentional dumping causes plentiful problems with increasing inhabitants since it consumes a substantial percentage of already inadequate landfill sites. According to statistics, the total solid waste generated in India is about 960 million tonnes of which the construction waste is 14.5 million tonnes (Pappu et al., 2007). However, this number is misleading since this only includes the waste that is properly disposed and accounted for (Talyan et al., 2008); there is also the practice of dumping construction waste by the roadside or on an empty plot of land and never documenting it. Therefore, it is an increased necessity to reduce levels of waste generated in the post disaster scenario due to environmental and economic reasons.

The management of this debris, as well as waste generated during reconstruction works poses significant challenges to national and local capacities. If such waste is not properly managed, it may cause serious environmental and economic burdens on normal living conditions as well as on the reconstruction phase itself. This includes the negative effect that debris can have on general municipal

waste collection and handling operations, which is one of the major challenges following disasters. These critical issues bear evidence to the fact that construction and demolition waste is becoming a global dilemma in post disaster scenarios.

3. Objectives

According to above discussions it is apparent that to implement effective post disaster waste management strategies, among many key issues, the capacity of a local area to cope with waste generated by a disaster emerges as a crucial issue. Therefore, the primary aim of this study is to identify capacities that need to be enhanced for a sustainable post disaster construction and demolition waste management process. The following are the objectives identified to achieve this aim:

- Understanding of key concepts of disaster management, waste management and capacity building
- Identification of relationships between construction and demolition waste within the context of post disaster scenario.

4. Research Methodology

A comprehensive literature survey was done on the concepts of post disaster management, waste management and capacity building by referring to official reports on rehabilitation and reconstruction efforts, text books, journals, articles, conference papers and electronic sources to familiarise and build up the research. The review will be extended to identify the relationship between construction and demolition waste within the context of the post disaster scenario.

An in depth analysis will be carried out to identify the key enabling factors of capacity building in post disaster waste management processes, based on the secondary data available through various sources. A framework will then be developed by incorporating the above findings to enhance the capacities in terms of economical, social and technological aspects which contribute to sustainable post disaster waste management processes.

5. Literature Findings

Since the study is at initial stage, scope of this paper is mainly based on the secondary data that is collected through a detail literature review.

6. Catastrophe Management

The world is facing a increased frequency and intensity of disasters – natural and man - made with devastating impacts. It is defined as “a hazard is a unusual or extreme event in the natural or human-made environment that adversely affects human life, property or activity to the extent of causing a disaster”. International Strategy for Disaster Reduction – ISDR (2004) , has defined disaster as a “serious disruption, of the functioning of a society, causing widespread human, material or environmental losses, which exceed ability of an affected society to cope using its own resources”.

With reference to above definitions, key words and phrases in disaster are “sudden or unexpected, crisis situation, serious disruption of functioning of a society, causing widespread human, material, or environmental losses and overwhelms local capacity”. It should also be noted that in disasters there are no prior warnings and thus, people are not adequately prepared. This can result in disruption of an entire system. This study considers only one natural disaster, in the recent tsunami, which is categorised under Earthquake Hazards. A tsunami is a series of enormous waves created by an underwater disturbance such as an earthquake, landslide, volcanic eruption, or meteorite.

Disaster management is a “collective term encompassing all aspects of planning for and responding to disasters, including both pre- and post-disaster activities”. It may refer to management of both risks and consequences of a disaster. The disaster management cycle illustrates the ongoing process by which governments, businesses and civil society plan for and reduce the impact of disasters, react during and immediately following a disaster and take steps to recover after one has occurred. The disaster management cycle is visualised as a two-phase cycle. The main phases are pre-disaster risk reduction phase and post-disaster risk recovery phase.

This research mainly concentrates on the rehabilitation phase of the disaster management cycle. The rehabilitation phase is also known as the transitional phase. The main activities of this stage include removal of debris, assessment of housing needs and establishment of a baseline and eligibility criteria; plan and construct transitional shelters/repair lightly damaged property, provide job opportunities to survivors, public work programmes etc. To initiate other phases of the disaster management cycle it is important to apply appropriate strategies to expedite the rehabilitation phase and reduce future impacts of similar disasters.

7. Waste Management: Construction and Demolition

There are scores of definitions introduced by many researchers on construction and demolition waste (C&D), which is posing to be a major environmental problem in many countries nowadays.

In general, waste is best defined as any material by-product of human or industrial activity that has no residual value. All definitions suggest that construction and demolition waste generated from construction, renovation or demolition of works, have a unique characteristic over other types of waste due to their residual value. Many researches proved that demolition waste contains higher proportion out of total solid waste generated in any country.

As discussed at the beginning, the construction industry is the leading waste generator in the world. Many researches prove this fact. Despite being a major generator of avoidable waste the industry has been slow to embrace environmentally friendly practices. Therefore, it is important to maximise environmentally sustainable values through minimising construction and demolition waste. Sustainability is a systematic concept, related to continuity of economic, social, institutional and environmental aspects of the human

society. Sustainable development or ecologically sustainable development is defined by the UN as “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

Therefore this study will propose a framework to enhance capacities to achieve sustainable post disaster waste management strategies.

8. Capacity Building

The term “capacity building (CB)” and “capacity development (CD)” are highly elastic, in that they can be stretched to embrace different activities. Such activities include capacity building in various unrelated organisations, management schools, agricultural research and development, non-governmental etc. The term capacity building often implies activities which are carefully planned and executed in order to build the capacity. Capacity development can be defined as a process by which individuals, groups and organisations improve their ability to carry out their functions and achieve desired results over time (Peter, 1997 cited by [18]). This definition highlights two important points: that capacity building is largely an internal process of development and that capacity development efforts should be results oriented.

Capacity building is defined in multiple ways. With reference to United Nations Centre for Economic Development (UNCED) (1992 cited [19]), capacity building encompasses a country’s human, scientific, technological and resource capabilities. A fundamental goal of capacity building is to enhance the ability to evaluate and address crucial questions related to policy choices and modes of implementation among development options, based on an understanding of environmental potential and limits perceived by people of a country concerned.

Capacity development is often needed to raise performance levels of a particular organisation. Organisational capacity refers to staff and resources, as well as its structure, management systems and linkages with other organisations. Organisational motivation refers to the culture and inducements which influence capacities of an organisation in pursuit of its goals. Finally, an organisation’s performance is reflected in its effectiveness, efficiency, and sustainability.

9. Conclusions

The generation of waste during a disaster is unavoidable and the only solution is waste minimisation. The primary area observed through this secondary review is the available opportunity to divert construction and demolition waste into reusable/recyclable building material. It can be mentioned that even though there are large number of opportunities in this regard in India this is still at the preliminary stage. Many constraints such as inconsistent nature of demolition debris, instability in the secondary material market, lack of interest, lack of government regulations, lack of interest for sorting, unavailability of required technology, improper and insufficient attention paid to quantification and identification of waste materials were identified as main reasons for being at the preliminary stage of waste management programmes. Finally, it can be concluded that the impact on the environment and economy from disaster waste can be minimised through proper benchmarking, being aware of consequences and trying to eliminate them.

Recently, the local industrial sector was changed to a certain extent, from its traditional fragmented processes towards a more client oriented business approach, which recognizes the importance of innovation, training and research. It was encouraged to modernise an organization by developing capacity and adopting collaborative and sustainable approaches within industrial sector of the country. This issue has still not significantly influenced the construction sector when compared to manufacturing and other industrial sectors. Therefore, this study will focus on enhancing capacities of post disaster waste management processes that will lead to sustainable waste management.

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