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# Madurai Regional Campus

# Entrepreneurship and Management: Innovative Construction Techniques and Ecological Development. *Vol. 1 Management* Part 1

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# Preface

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# Safety Management Practices of New Entrepreneurs in Food Industry

**Akshaya and Aarthy**

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**Abstract**

Food is considered as basic need for leading a life. Even Maslow's hierarchy of needs theory has stated this. For a food industry. Ensuring food safety is vitally important but problematic in the densely populated Asia-Pacific region because most food producers and processors are SMEs. SMEs are constrained by limited resources and a lack of expertise concerning food safety standards and management systems.

**Key words:** safety management, food industry, new entrepreneurs

## Introduction

Food moves from farms to consumers via supply chains composed of multiple actors. Since safety hazards can enter the food chain at any stage from farm to fork, adequate control under ISO22000, a generic food safety management standard, is essential. ISO22000 integrates the principles of Hazard Analysis and Critical Control Point (HACCP) application steps developed by the Codex Alimentarius Commission. It defines general food safety requirements that should apply to all organizations regardless of size and anywhere in the supply chain regardless of the process involved. Therefore, combined efforts of all parties throughout the food chain is required. ISO22000 provides the frame-work for a harmonized food safety standard that is accepted worldwide.

The Chernobyl disaster highlighted the importance of safety culture and the effect of managerial and human factors on safety performance.[4][5] The term 'safety culture' was first

used in INSAG's (1988) 'Summary Report on the Post-Accident Review Meeting on the Chernobyl Accident' where safety culture was described as:

"That assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance."

Since then, a number of definitions of safety culture have been published. The U.K. Health and Safety Commission developed one of the most commonly used definitions of safety culture: "The product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation's health and safety management". "Organisations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety and by confidence in the efficacy of preventive measures."

**Need for the Study**

This study takes an initiative measure to provide an idea for the budding entrepreneurs in food industry to take a proactive approach regarding safety measures in that sector. The study investigates the effectiveness of a proactive approach designed to help small enterprises to set up and operate a simple health and safety management system. The approach is based on the introduction of a health and safety policy and risk assessment with the development of appropriate subsequent control measures.

**Literature Review**

In the study of "Implementation Of Food Safety Management Systems In the UK", Lena Dzifa mensah', Denyse Julien suggested in their findings that there is no significant effect of size of enterprise on the drivers, benefits and challenges to compliance with food safety regulation and their paper examines the response of food manufacturing enterprises to food safety regulation, and uses statistical techniques to investigate the effects of enterprise size on the

drivers for, benefits of, and challenges to compliance. Further, the factors that influence the successful implementation of an integrated food safety management system are also examined. The results show a great deal of both statutory and private regulation that has incentivised enterprises. In response, enterprises have implemented integrated food safety management systems to proactively deal with the risks associated with food safety, however, enterprises claim that statutory regulations are biased towards consumers, without adequate impact assessments on all stakeholders within the chain, and hence causing industry to incur significant costs that could otherwise be avoided**.**

Another study "A Microbial Assessment Scheme To Measure Microbial Performance Of Food Safety Management Systems" by L. Jacxsens', J. Kussaga, P.A. Luning M. Van der Spiegel, F. Devlieghere, and M. Uyttendaele revealed that the objective of their work is to explain the development of a Microbial Assessment Scheme (MAS) as a tool for a systematic analysis of microbial counts in order to assess the current microbial performance of an implemented FSMS. It is assumed that low numbers of microorganisms and small variations in microbial counts indicate an effective FSMS.

In another study**,** "Food safety performance indicators to benchmark food safety output of food safety management systems" by L. Jacxsens , M. Uyttendaele, F. Devlieghere, J. Rovira, S. Oses Gomez and P.A. Luning, published in International Journal of Food Microbiology On Volume 141, Supplement, 31 July 2010, Pages S180–S18 it was told that there is a need to measure the food safety performance in the agri-food chain without performing actual microbiological analysis Validation was conducted on the basis of an extensive microbiological assessment scheme (MAS). The assumption behind the food safety performance diagnosis is that food businesses which evaluate the performance of their food safety management system in a more structured way and according to very strict and specific criteria will have a better insight in their actual microbiological food safety performance, because food safety problems will be more systematically detected. The diagnosis can be a useful tool to have a first indication about the microbiological performance of a food safety management system present in a food business.

## Introduction to Food Safety Management System

The Food Safety Management System (FSMS) provides a preventative approach to identify, prevent and reduce food-borne hazards. This is to minimize the risk of food poisoning and to make food safe for consumption. A well designed FSMS with appropriate control measures can help food establishments comply with food hygiene regulations and ensure that food prepared for sale is hygienic and safe for consumers.

With effect from June 2014, all caterers will be required to submit a proper Hazard Analysis Critical Control Point (HACCP)-based FSMS with reference to the Singapore Standard SS583:2013 as a basic guide. This is in accordance with the new requirement in the revised Code of Practice on Environmental Health (COPEH), where all new and existing caterers are required to implement a HACCP-based FSMS before obtaining or renewing their license.

To improve food hygiene standards in the food industry, NEA requires all new and existing caterers to implement an FSMS before obtaining or renewing their license.The Food Safety Management System (FSMS) is a programme that identifies and controls food safety hazards at every stage of food preparation through a holistic system of controls covering the following elements:

- HACCP (Hazard Analysis and Critical Control Points system) principles; A scientific and systematic approach to identify, prevent and reduce food-borne hazards in the food process chain.
- Pre-requisite programmes which are the basic programmes and practices that establishes and maintains a hygienic environment. (e.g. a daily regime to monitor food handlers' practices during food preparation, to screen staff to ensure those who are unwell are not to handle food, regular pest control regime and cross-contamination prevention procedures.)
- Efficient and accurate maintenance of documentation and records to ensure the efficient monitoring of FSMS and allow traceability of hazards to the contamination source

From **1st June 2014,** all caterer licensees and new applicants are to comply with the following FSMS requirements

**New Caterers**

All new applicants for catering licences are required to submit an FSMS plan within the first three months of the licence issuance date.

**Existing Caterers**

Existing caterer licensees will have to submit an FSMS plan at least three months before their next licence renewal date, starting with licences expiring from 1st September 2014.

**Training for All Caterers**

All caterer licensees are required to appoint at least one staff of supervisory role per licensed premises (e.g. food hygiene officer, head chef or operations manager), preferably in-charge of day-to-day operations, to undergo and pass the course in "WSQ Apply FSMS for Food Service Establishments". Licensees are required to submit a copy of the Statement of Attainment (SOA) to NEA

**ISO 22000 - Food safety management**

ISO 22000 is a standard developed by the International Organization for Standardization dealing with food safety. It is a general derivative of ISO 9000.

The ISO 22000 family of International Standards addresses food safety management.The consequences of unsafe food can be serious and ISO's food safety management standards help organizations identify and control food safety hazards. As many of today's food products repeatedly cross national boundaries, International Standards are needed to ensure the safety of the global food supply chain. The ISO 22000 family contains a number of standards each focusing on different aspects of food safety management.

- ISO 22000:2005 contains the overall guidelines for food safety management.
- ISO 22004:2014 provides generic advice on the application of ISO 22000

- ISO 22005:2007 focuses on traceability in the feed and food chain
- ISO/TS 22002-1:2009 contains specific prerequisites for food manufacturing
- ISO/TS 22002-2:2013 contains specific prerequisites for catering
- ISO/TS 22002-3:2011 contains specific prerequisites for farming
- ISO/TS 22002-4:2013 contains specific prerequisites for food packaging manufacturing
- ISO/TS 22003:2013 provides guidelines for audit and certification bodies

**Hazard Analysis Critical Control Points (HACCP)**

HACCP is a preventative food safety management system in which every step in the manufacture, storage and distribution of a food product is analyzed for microbiological, physical and chemical hazards.

HACCP can be critical to your compliance with national or international food safety legislation. It provides a risk management tool that supports other management systems standards across the food industry – such as ISO 22000 Food Safety Management. HACCP outlines good manufacturing processes for all food sectors and can be key to your business when taking part in international trade. It is especially suitable for primary producers, manufacturers, processors and food service operators.

This risk management tool is primarily used to manage food safety risks. A HACCP system allows you to identify hazards and put in place controls to manage these throughout your supply chain during production. The HACCP scheme meets the requirements of the Codex Alimentarius Commission (CAC) – established by the World Health Organisation and the Food and Agriculture Organisation of the United Nations to bring together international food standards, guidelines and codes of practice to ensure fair trade. It can also be used to support the requirements of management standard requirements, such as ISO 22000 Food Safety Management.

The benefits we obtain from HACCP

- Implement internationally recognised food safety hazard controls
- Demonstrate your commitment to food safety
- Give producers, stakeholders and suppliers confidence in your controls
- Align HACCP with ISO 22000 to improve food safety management systems
- Effectively manage food safety risks across the whole supply chain
- Continually review and improve your system so it stays effective

**HACCP for SMEs**

Food safety management is paramount to your business – whatever its size or location. And HACCP can add value to your entire supply chain with improved hazard controls. We understand that small companies may have less time and smaller budgets to work with. We also understand how to overcome these challenges with service packages tailored to your business. A customised HACCP package removes the unnecessary cost and complexity of achieving the right standards of food safety. So we can help you get to where you want to be as efficiently as possible.

**How to Get Certified to HACCP**

We make the HACCP certification process clear. After we have received your application we appoint a Client Manager who will guide you and your business through the following steps:

1. **Read the HACCP standard**

   To implement HACCP, you will need to get a copy of the standard so that you can understand your requirements. You can download the HACCP and GMP standard.

2. **Implement the HACCP standard**

   You can then implement the standard within your organization. This would include writing a HACCP Plan according to the standard's requirements. If you need assistance, you can attend our HACCP Requirements training course, which will not only teach you how to write a plan, but will help you develop a plan during the course.

3. **Gap analysis**

   This is an optional pre-assessment service where we take a closer look at your existing food safety management system and compare it with HACCP requirements. This

helps identify areas that need more work before we carry out a formal assessment, saving you time and money.

4. **Formal assessment**

   This happens in two stages. First we review your organization's preparedness for assessment by checking if the necessary HACCP procedures and controls have been developed. We will share the details of our findings with you so that if we find gaps, you can close them. If all the requirements are in place, we will then assess the implementation of the procedures and controls within your organization to make sure that they are working effectively in line with the standard.

5. **Certification and beyond**

   When you have passed formal assessment you will receive a HACCP certificate, which is valid for three years. Your client manager will stay in touch during this time, paying you regular visits to make sure your system doesn't just remain compliant, but that it continually improves.

**Integrate HACCP With ISO 22000**

HACCP can stand alone as a management tool in your business. It can also be integrated with other management systems, such as ISO 22000 Food Safety Management. HACCP supports the implementation of ISO 22000 as they share common requirements for controlling food safety risks. This means you can streamline the way you manage and deliver common processes.

## Application of Science to Food Safety Management

It is difficult to conceive of a food safety system that responds effectively and efficiently to emerging microbiological food safety concerns that does not permit rapid changes in approach based on advances in science. Flexibility to respond to new information and hazards will require unfettered data sharing. In addition, such a system cannot rely on the use of prescribed microbial control processes but instead must emphasize validation and verification of the control methods used.

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### 1) Risk Assessment

**Risk assessment is becoming a foundation for selecting food safety management options. Risk assessment is an iterative process, and assessments must be updated as additional information becomes available. Although essential, scientific data are a very substantial limiting factor in the application of risk assessment. Appropriate and aggressive data collection throughout the food production and processing system is essential for valid risk assessments and the resulting food safety improvements. Procedures must be implemented to obtain data from food manufacturers in "penalty-free" environments so the data can be properly evaluated by public officials and the results made available to all interested parties.**

## Risk Management

Regulatory agencies should work with other public health officials and interested parties, including industry and consumers, to establish Food Safety Objectives (FSOs). FSOs offer a means to convert public health goals into values or targets that can be used by regulatory agencies and food manufacturers. FSOs, which can be applied throughout the food chain, specify the maximum level of hazard that would be appropriate at the time a food is manufactured. FSOs would enable food manufacturers to design processes that provide the appropriate level of control and that could be monitored to verify effectiveness.

The FSO approach can be used to integrate risk assessment and current hazard management practices into a framework that achieves public health goals in a science-based, flexible manner. FSOs help translate the outcome of risk assessment into something that can be used with Hazard Analysis and Critical Control Point (HACCP) systems. The FSO approach will be successful when directly intertwined with a food processor's good manufacturing practices (GMPs) and HACCP systems.

**Hazard Control and Monitoring**

HACCP is a science-based food safety management approach that has been widely adopted and effectively applied to improve food safety. However, HACCP may not be appropriate for all circumstances. It is not possible to have a valid HACCP plan when a scientific analysis does not identify any point that meets the critical control point criteria. HACCP implementation must remain flexible to incorporate scientific knowledge and data in a product- and process-specific manner that best meets FSOs.

The application of HACCP to primary production is particularly limited, because all the HACCP principles generally cannot be achieved. Well-defined, science- based good agricultural practices should be further developed for specific commodities. Additional research will be necessary to better understand the microbial ecology in these agricultural environments and to formulate science-based recommendations for pathogen control. Routine microbiological testing is useful for some purposes but not for others. It can focus on pathogens of interest or on nonpathogenic microorganisms whose presence indicates conditions favourable to the presence of pathogens. Testing is useful for surveillance and HACCP verification purposes. It also is used for validating and revalidating control procedures.

Microbiological testing of finished product, however, can be misleading, because negative results do not ensure safety. Testing has statistical limitations based on the amount of product sampled, the percentage of product that is contaminated, and the uniformity of the

distribution of contamination throughout the food. As the amount of contamination in the food decreases, the food safety emphasis should focus on further controlling processing conditions through the application of science-based HACCP systems.

**Foodborne Illness Surveillance**

Human food borne disease surveillance will continue to be very important to: (1) identify outbreaks of food borne disease so they can be controlled and prevented; (2) determine the causes of food borne disease; (3) improve control strategies; and (4) monitor trends in occurrence of food borne disease. Comprehensive, coordinated surveillance activities must be expanded to include animal health and the production and processing environments. Further integrating animal and environmental surveillance systems into established human surveillance systems will increase our understanding of the epidemiology and sources of food borne disease.

Recognizing that food safety is a fundamental and continuing issue, the Institute of Food Technologists commissioned an expert panel to review the available scientific literature related to emerging microbiological food safety issues. The panel's report is divided into seven sections: Introduction, Pathogenicity, Human Hosts, Microbial Ecology, Application of Science to Food Safety Management, Next Steps, and Conclusions. Copies of the report are available at www.ift.org. Founded in 1939, IFT is a 28,000 member nonprofit scientific society for food science and technology.

**Conclusion**

Food is the basic necessity for all of us and we all earn money to get this basic necessity. We need to eat 3 meals a day to keep our body running so that we can manage our daily functions. Many of us "Eat food to live" while there are others who "Live to eat food". So food industry is the perfect choice for the new emerging entrepreneurs. The food they provide must be clean and hygiene and follow the above mentioned proactive approaches for the safety of the people for whom they manufacture. No compromises in quality of foods they produce will make them succeed in their career as entrepreneur.

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# Study on Safety Management in Construction Projects

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**Abstract**

Construction industry contributes to 11% of gross domestic products in most developing countries. However many construction activities are inherently health and safety risks such as working at height, working underground, working in confined spaces and close proximity to falling materials, handling load manually, handling hazardous substances, noises, dusts, using plant and equipment, fire, exposure to live cables and poor housekeeping. In an urban context, health and safety accidents are relatively higher due to the fact that high rise buildings remain predominant with the fast-growing complexities of domain-wide construction projects to cope with modernizing cities arena and high demand for housing, offices, services and other infrastructures due to the high urbanization. Despite its importance, therefore, construction industry is considered as being risky with frequent and high accidents rate and ill-health problems to workers, practitioners and end use. Hence it is necessary to apply safety management in construction projects.

**Key Words**: safety, management, construction, employee.

## Introduction

A safety management system provides a systematic way to identify hazards and control risks while maintaining assurance that these risk controls are effective. Construction industry is an important part of the economy in many countries and often seen as a driver of economic growth especially in developing countries. In construction workplaces the workers are exposed to hazards of occupational diseases and injuries and the adverse effects of excessively long hours of work. Machines, plants and other sophisticated construction equipment pose danger to the

operators, who in most cases do not have prior skills for operating such machines or plants. A worker should be assigned duties in relation to his physical and mental health and skills. Further, employers should have complete control over their employees and therefore ensure adherence to safety practices. The company must comply with all provisions of safety and health regulations that pertain to the construction work itself.

**Objectives of the Study**

- The focus of this study lies in the health and safety of work environment during the construction process.
- The study is concerned with the management of health and safety particularly the measures that are put in place, the challenges encountered in the health and safety management and the adequacy of the enforcement mechanisms on health and safety in the construction sites.

The construction industry has earned the reputation of being a dangerous or highly hazardous industry because of the disproportionately high incidence of accidents and fatalities that occur on construction sites around the world. Internationally, construction workers are two to three times more likely to die on the job than workers in other industries while the risk of serious injury is almost three times higher. Health and safety therefore is an economic as well as humanitarian concern that requires proper management control. One of the most common myths that have plagued this industry is that health & safety comes at a cost. Construction managers tend to believe that introducing and executing measures that ensure health and safety in construction sector will lead to higher cost, and hence lower profitability. However, it has been proved that investment in construction health and safety actually increases the profitability by increasing productivity rates, boosting employee morale and decreasing attrition.

Construction safety and health management therefore deals with actions that managers at all levels can take to create an organizational setting in which workers will be trained and motivated to perform safe and productive construction work. The system should delineate

responsibilities and accountabilities. It should also outline procedures for eliminating hazards and identifying potential hazards before they become the contributing factors to unfortunate accidents.

**Safety Management in Construction Projects**

The construction industry is concurrently recognized as a major economic force and one of the most hazardous industries. Accidents not only result in considerable pain and suffering but marginalize productivity, quality, time and negatively affect the environment and consequently add to the cost of construction. Considering the adverse impacts of accidents, construction health and safety management is of genuine concern to all stakeholders in the construction industry. In most developing countries, health and safety consideration in construction project delivery is not given priority, and employment of safety measures during construction is considered a burden. Health and safety has been identified as a parameter which should be used along with the additional parameters: cost, quality and time, to measure the success of projects. The reasons for considering safety and health are human factor, legislation and financial issues

Unfortunately, health, safety and the environment are often neglected on construction sites and rarely managed. Safety and health is often discussed in site management meetings as a priority, while in reality safety and health takes a low priority to budget and time discussions. A general survey in the construction industry indicates that adequate measures for health and safety in the sites have not been put in place and also various challenges are encountered in the management of health and safety in construction. This manifests itself on construction sites as numerous accidents/ injuries, health problems which result to hospitalization and absenteeism.

A number of factors having a negative impact on health and safety management in developing countries which include poor infrastructure; problems of communication due to low literacy level; unregulated practices on construction sites; adherence to traditional methods of working; non availability of equipment; extreme weather conditions; improper use of equipment and corruption. The culture of the construction industry in developing countries also does not

promote health and safety. The practices of competitive tendering and award of most public contracts to the lowest bidder in many developing countries compels contractors to drive their prices low while cutting costs which in turn affects health and safety.

Construction sites are dangerous places, and first aid and rescue equipment should always be available. What is needed depends on the size of the site and the numbers employed, but there should be a blanket and a stretcher. On large sites with more than 200 people are employed, there should be a properly equipped first aid room. On any construction site of that size, at least one person on every shift should have been trained in first aid to a nationally recognized standard. On day -to-day works procedures, an accident register book should be kept at the site, in which all types of minor injury such as bruises, to major accidents like imputing disability and fatal should be recorded. Work in the construction industry is tough and involves much manual or physical activity. It is also hazardous and dirty and therefore good welfare facilities not only improve workers' welfare but also enhance efficiency. Welfare facilities such as the provision of drinking-water, washing, sanitary and changing accommodation, rest-rooms and shelter, facilities for preparing and eating meals, temporary housing, assistance in transport from place of residence to the work site and back, all help to reduce fatigue and improve workers' health.

Therefore health and safety measures employed on construction sites are inadequate and fail to meet the required standards. The culture and attitude of construction workers and the site supervisors about health and safety often condone risk taking and unsafe work practices. Lack of proper information and ignorance are also to blame for the poor safety measures in construction sites. For instance some workers felt that the safety equipment such as hard helmets and reinforced boots are too cumbersome and uncomfortable.

Some of the major challenges in the management of health and safety in the constructions sites included inadequate personal and protective equipment, poor maintenance of personal protective gear, lack of top management support in the management of health and safety in construction sites, inadequate enforcement mechanisms, inadequate welfare facilities, absence of

safety and health committees, unawareness of health and safety matters among the workers and lack of equipped first aid kits on the construction sites. Welfare facilities were also noted as a big challenge since they are not adequately provided as well as personal protective equipment. Some site supervisors indicated that lack of adequate funds, lack of monitoring and evaluation, lack of personal protective equipment implementation programs among others as some of the factors that give rise to the above challenges.

## Conclusion

Site managers should have a written safety policy for their enterprise setting out the safety and health standards which it is their objective to achieve. The policy should name the senior executive who is responsible for seeing that the standards are achieved, and who has authority to allocate responsibilities to management and supervisors at all levels and to see they are carried out. Construction safety policy therefore is something that must be developed by each site manager and operating company prior to starting any construction job. Once developed the development safety plan should be placed into a training program that's needed to be participated in by every site worker previous to partaking in any job found on the positioning irrespective of the roles simplicity. The absence of site meetings as established in this survey implies that workers are not given a forum learn about various risks on the sites and supervisors equally do not have opportunities to communicate important health and safety matters to the workers. Site meetings are one of the ways of sensitizing workers on their health and safety in the site and should therefore be held frequently. [5]

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# Advanced Waste Management- Need of the Hour

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**Abstract**

The problems of waste generation and management has become a serious issue of concern to many scholars in environmental studies. This paper critically examine the attitude of urban dwellers to waste disposal and management. One hundred and fifty copies of questionnaire were administered to residents in the area. Information such as the various classes of waste, frequency of waste disposal and methods of waste evacuation were obtained from the questionnaire. Finding revealed that family size has a great influence on waste disposal and generation which was evidence in the hypothesis with a calculated value of 7.32 greater than the critical value of 2.43 at 0.05 level of significance. Besides, environmental enlightenment has changed people's attitude towards waste generation and management in the area. This was affirmed in the calculated f-value of 3.18 greater than critical t-value of 1.97 at 0.05 level of significance. However, this result indicate that effective environmental enlightenment would help avert the attitude of urban dwellers to waste disposal and management in the area.

**Key Words**: Urban dwellers, waste generation, attitude, waste disposal, human ecosystem.

## Introduction

Waste management is an important part of infrastructure for cities, towns and countries. Many consider today's society to be a throwaway society where commodities are so inexpensive that it's easier to throw things away that don't work (rather than fix them) and the convenience of disposable items fits with a person's busy lifestyle. Many people stuff everything they don't need into a trash bag and put it outside their home once a week and don't give it

another thought. The result of that thinking is that waste management is huge resource glutton that takes people, money and fleets of vehicles to manage.

Managing waste at landfill sites is a detailed job. Individuals should sort their garbage and recycle wherever possible. Composting and recycling are very helpful in the reduction of solid waste. Self-serve landfill sites often have a place for people to put their hazardous waste, glass recycling, newspapers, metal recycling as well as old appliances, tires and other goods. If your garbage is picked up for you, you should have a recycling program also. If you live in an apartment and recycling services are not offered, you need to inquire about them so that they are put in place.

**Recycling Our Way to a Greener Planet**

Recycling is the act of reusing products rather than simply disposing of them after you use them. To recycle is extremely helpful to your environment. The manufacturing process requires a lot of energy and raw materials. This uses up valuable resources and can also harm the environment. Once those goods are made and then used, many of them are simply discarded. The process of recycling them either in your home for other uses or having them sent to a recycling facility to be either reused or made into something else is a responsible and commendable act. Simply recycling household items such as clothing, cans, bottles and paper goods can make a huge difference.

For generations, most people simply put out the trash without giving a thought to where it went. Consequently, landfill sites are overflowing and garbage is a huge problem. Many cities have simply run out of places to put their trash and as a result, some companies and trucking companies now exist simply for the sole us of transporting garbage to other places. Small rural communities are protesting in various places in such as in northern Canada because new landfill sites or old mining sites are being used to house the garbage of large urban cities. A great amount of this trash could be recycled or composted but ignorance and laziness create a big

problem. Many individuals don't take the small portion of time it takes to sort their trash and recycle. This problem exists all around the world.

Many places offer curb side pickup for recycling. Sorting your recyclable goods such as newspapers, glass and metal containers into a box allows facilities to sort and put them through their facilities to either wash and reuse them or manufacture them into other useable goods. Many products go through a recycling process several times before they're rendered useless. Some areas require recycling by law and will not accept trash bags that have recyclable goods in them.

**Glass Recycling - Key in Environmental Responsibility**

Glass products are widely used throughout the world for storage of food, beverages and household and industrial products. Glass also used in dishes, and throughout your home in decorations or as windows for your home or vehicle. When a glass item is no longer useful to you, glass-recycling facilities exist to allow the product to be reused.

Glass is one of the most reusable products there is. Many recyclable items have a short lifespan and break down each time they are recycled or down cycled. This isn't the case with glass. Glass recycling can occur repeatedly and indefinitely, as there isn't a deterioration or

breakdown of glass particles. Glass can be cleaned, broken, crushed, melted and reused for multiple purposes.

You can help your environment by recycling your glass. A large portion of landfill sites is filled with glass bottles, containers and other glass goods. These take up a large amount of resources to bring to the landfill and a vast amount of space to store. Because they aren't biodegradable such as organic waste, they create a space issue. By recycling your glass, you are not only saving space at landfill sites but also saving the environment. Glass furnaces used to create new glass use significantly more energy and create toxic fumes rather than the much smaller amount of energy required to reuse that glass product.

You can return glass bottles for beverages such as soda pop to many facilities for a refund in many areas. Or, you can prepare your glass products for curb side collection or drop off at a recycling facility. Cleaning out your containers and removing lids and labels is very helpful as well as sorting via coloured versus non-coloured glass. Different types of glass can be used for various things so where your facilities exist, be aware of their sorting preferences. Some recycling plants do all the sorting for you whereas others require more care.

Because glass is so reusable, consumers who practice recycling are helping drive down the cost of virgin glass products. Glass products have been used over history and continue to be a renewable resource for us. Glass is used in many industrial and construction fields as well as for food storage. A recent problem is the CRT (cathode ray tubes) glass used in electronics such as computer monitors. Efforts are being made to find ways to better recycle this glass, as it isn't as readily reusable as other glass products due to special anti-radiation coatings that are used to protect consumers.


**The Importance of Industrial Waste Management**

It takes a lot of valuable energy and materials to create and manufacture products and the resulting industrial waste can be difficult to manage. Many cities and countries have put new laws into place to heavily tax companies that produce excess amounts of waste or create potentially harmful effects on the air and ecosystem. The extra taxes help to offset the environment damage by going toward environmental restoration, protection and spreading information to increase knowledge on these issues. People and companies need to educate themselves about the environment. Smog alerts in many cases result from not only harmful transportation emissions but also from the output of factories into the air we breathe.

Companies need to be responsible with their industrial waste management and specifically their hazardous waste. Many local governments provide counselling, consulting and recommendations to organizations on what they can do to better manage their waste and plan for a more environmentally friendly production processes. More than ever, there need to be consequences to companies that do not take waste management seriously. Part of this includes reducing harmful emissions into the environment over a period of time and correctly disposing of waste materials.

Countries have terms and conditions about what is acceptable in terms of waste management. Today, more than ever, industries know their impact of manufacturing on smog levels and the escalating cost of managing their waste. More industrial leaders are showing their accountability for the environment. Citizens need to support companies whose business practices include environmentally conscious and responsible conditions. Using energy more efficiently, reducing the hazardous waste they output into the air and to the landfills and practicing composting and recycling are key factors in improving the way waste is managed.

Companies who have no choice but to continue creating hazardous industrial waste due to the nature of their business need to ensure that they properly dispose of that material and are upfront an honest about the contents of their vehicles, their facilities and management of the waste. Environmental protection acts encourage and reward companies who do their part to more effectively manage waste and work with environmental agencies to maximize efforts to minimize the impact on the environment. Industrial waste producers need to pay for the disposal

of their materials and in particular, need to take caution in the way they dispose of hazardous materials. There have been cases documented of companies mislabeling goods and of irresponsible practices leading to contamination of local watersheds. The more that citizens and government push for reform, the more companies will realize that they are accountable for their industrial waste.

**Brownfield Sites, Regeneration and Conservation**

Brownfield is the name given to a piece of land that was previously used but may now be considered contaminated due to industrial use. The level of contamination can vary. Some countries such as the United Kingdom prefer to refer to these sites as PDL (previously developed land) sites but these terms in essence refer to the same land. Brownfield sites may be places that were previously industrial factories or locations that might have had waste stored at that location or been subjected to many types of hazardous or potentially hazardous chemicals. While most brownfield sites exist in industrial neighborhoods, some do exist in residential areas in older stores and small factories.

There are many brown field initiatives to reuse these locations or regenerate them in a way that is an improved situation for the environment. Some cites offer incentives to builders and real estate developers to use previous brown field sites for new residential and commercial building projects so as not to disturb other areas that are already green space and subject the city to more development. The issue with this is the potential for liability later, should health problems occur as a result of the site's previous status. Some brown field sites have hazardous materials buried there or have contaminated watersheds. Initiatives to either regenerate these properties or leave them vacant while they regenerate themselves can have positive effects on the environment and ecosystem. Some brown field sites are becoming conservation areas or parks to enrich communities. It's a positive thing that sites are designated in this manner for those interested in using it. It's important to know when building a structure such as medical facility, school or residential home what that location was previously used for and if there's a possibility of associated health risks.

Other classifications of land or property exist such as Greenfields and Greenfields. Greenfields are empty lots that contain outdated buildings or unused space but not due to possible contamination. These may simply be in an area that is not booming or has few amenities to attract buyers or leasers. Greenfields are areas designated to stay green or to be environmentally protected such as conservation areas or greenbelts. Many cities have initiatives to either use Greenfields as a last resort after Brownfield and Greenfield locations. Other locations are protected in order to remain or become permanently protected green space.

It's important to environmental planning and improvement that classifications such as brown field sites continue to exist in order to keep the public informed.

**Nuclear Waste Disposal**

The management of nuclear waste disposal is frightening for many people. People are concerned because of the scale of problems that would result from human error. Errors that have occurred in the past frighten individuals into thinking that nuclear energy and nuclear products should be avoided. Also, because nuclear power can be harnessed into weapons of mass destruction, this has made nuclear a feared word.

Nuclear waste can be dangerous. Radioactive products, nuclear byproducts resulting from use in modern medicine, and products such as uranium, and plutonium are a concern. Responsible management of these products is crucial to environmental safety and the safety of residents.

As many nuclear power plants are coming to the end of their lifecycle, citizens are concerned with how they will be managed. Nuclear waste is stored and the concern of a leak or accident is very troubling. The fact is that organizations responsible for the management of nuclear waste disposal are accountable and run under very detailed and careful processes and regulations with inspections and detailed safety measures. Nuclear energy is clean and safe. Stories about situations like Chernobyl in the former Soviet Union frighten people. In that situation, the lid from a Nuclear reactor blew and the resulting fire and radioactive contamination that spread resulted in many deaths. To this day, 3,000 square miles around that power plant remain quarantined due to the contamination. Accidents do happen but overall the management of nuclear waste is handled responsibly. Unfortunately, what happened at Chernobyl taught lessons to power authorities on how handle such situations and has helped to prevent such things from occurring on a larger scale.

In managing nuclear waste, some products are buried in sealed containers for either long term or short-term storage. Other products go through a process of transmutation. Transmutation takes the nuclear waste and transforms it into a less harmful product or to a product with a shorter shelf life. All in all, most countries through careful processes are very responsible about nuclear waste disposal.

## Conclusion

A continuing rise in the rate of waste production is no longer acceptable – hazardous waste affects the health of millions of people and poisons large areas of our planet. In many places people live surrounded by garbage and landfills. It is essential that governments and

corporations face up to waste, using what we know about reduction, recycling and reuse, but also developing new technologies that eliminate waste.

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# An Organisational Study about Advance Waste Management

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**Abstract**

More production equals more waste, more waste creates environmental concerns of toxic threat. An economical viable solution to this problem should include utilization of waste materials for new products which in turn minimize the heavy burden on the nation's landfills. Recycling of waste construction materials saves natural resources, saves energy, reduces solid waste, reduces air and water pollutants and reduces greenhouse gases. The construction industry can start being aware of and take advantage of the benefits of using waste and recycled materials. Studies have investigated the use of acceptable waste, recycled and reusable materials and methods. The use of swine manure, animal fat, silica fume, roofing shingles, empty palm fruit bunch, citrus peels, cement kiln dust, fly ash, foundry sand, slag, glass, plastic, carpet, tire scraps, asphalt pavement and concrete aggregate in construction is becoming increasingly popular due to the shortage and increasing cost of raw materials. In this study a questionnaire survey targeting experts from construction industry was conducted in order to investigate the current practices of the uses of waste and recycled materials in the construction industry. This study presents an initial understanding of the current strengths and weaknesses of the practice intended to support construction industry in developing effective policies regarding uses of waste and recycled materials as construction materials.

**Key Words:** Waste management, constructions, materials. Environmental, Recycling.

## Introduction

Infrastructure work for the housing development at Telegraph Bay will generate variable quantities and types of waste materials. This section of the EIA report involves an assessment of

the potential environmental impacts from the waste generated for the proposed development. Reclamation work at Telegraph Bay was completed in 1989. The prime consideration relates to the excavation and removal of 330,000m3 of imported surcharge material and 156,400m3 of other excavated soils from the advance works and construction phase of the development. Post development considerations (following site occupation) have also been incorporated within this assessment. The principal considerations include:

(i) Evaluation on the type and nature of wastes;

(ii) Estimation of total volumes; and

(iii) Assessment of handling, storage, transportation and disposal methods to be adopted and the potential environmental impacts.

## Objectives

The overall objectives of the waste management assessment are summarised below:

- To assess the activities involved for the proposed and determine the type, nature and estimated volumes of waste to be generated;
- To identify any potential environmental impacts from the generation of waste at the site
- To recommend appropriate waste handling and disposal measures / routings in accordance with the current legislative and administrative requirements;
- To categorise waste material where practicable (inert material / waste fractions) for disposal considerations i.e. public filling areas / landfill.

## Materials and Methods

### Tire Rubber

An estimated number of one billion scrap tires have been disposed of in huge piles across the United States. An additional 250 million tires unaccounted for are discarded yearly (RMA, 2011). Whole tires have been used in artificial reefs, break waters, dock bumpers, soil erosion control mats and play ground equipment. Several studies have shown that tire waste can be

successfully used in concrete, grass turf, asphalt mix, embankments, stone cladding, flowable fill and clay composite.

**Reclaimed Asphalt Pavement**

The transportation sector has used Reclaimed Asphalt Pavement (RAP) for many years. In 2009, the amount of RAP used in asphalt pavements was 56.0 million tons and in 2010, 62.1 million tons. RAP is America's most recycled and reused material; currently, RAP is being recycled and reused at a rate over 99%. RAP is used to backfill pavement edges, rework base and base course. According to the World Business Council for Sustainable Development, manufactures around the world produce more than 25 billion tons of concrete yearly.

**Recycled Concrete Aggregate**

The Federal Highway Administration (FHWA) projected an increase in aggregates to over 2.5 billion tons per year. Crushed aggregate has been used as base course or granular base in highway construction. Its primary function is to increase the load capacity of the pavement and to distribute the applied load to avoid damage to the sub grade.

**Roofing Shingles**

Each year, the U.S. generates approximately 11 million tons of asphalt roofing shingle scrap (CalRecycle, 2006). Use of recycled asphalt shingles (both manufacturer's waste and tear-offs) increased from 702,000 tons to 1.10 million tons from 2009 to 2010, which represents a 57% increase. Assuming conservative asphalt content of 20% for shingles, this represents 234,000 tons (1.5 million barrels) of asphalt binder conserved. Roofing shingles are made from a fiberglass or organic backing, asphalt cement, sand-like aggregate and mineral fillers such as limestone dolomite and silica. Beneficial applications include, but not limited, to Hot Mix Asphalt (HMA), cold patch mix asphalt, aggregate substitute, base course, mineral filler and granular base stabilizer. Benefits of using roofing shingles include Lower disposal costs for shingle scrap manufactures, reduced cost in the production of HMA, improved the rutting

resistance of the mixtures considerably, due to a combination of the fibers and harder asphalt and improved resistance to pavement cracking.

**Glass**

Americans generated 11.5 million tons of glass in the Municipal Solid Waste (MSW) stream in 2010. Glass is composed of silica or sand and contains some amounts of limestone and soda ash used to produce uniform quality and color. According to the Association of Cities and Regions for Recycling (ACRR), people around the world send 1.5 million tons of glass to landfills each year. Glass that ends up in the landfill won't break down for over a million years. Glass cullet creates workability problems in concrete mix and the likely hood of alkali-silica reaction. Beneficial uses are in the secondary applications, such as in the manufacture of fiberglass insulation, roadbed aggregate, driving safety reflective beads and decorative tile.

**Plastic**

In 2010, plastic waste generated approximately 31 million tons, representing 12.4% of total Municipal Solid Waste. Uses of recycled plastic in the construction industry include plastic strips to add to soil embankments, which has positive results of increasing the measured strength in reinforcement of soils. HMA mixture has a higher stability, reduced pavement deformation; increase fatigue resistance and provide better adhesion between the asphalt and the aggregate (Awwad and Shbeeb, 2007). Grinded polyethylene to provide better coating or attached easily to the aggregate as the surface area of the polymer increases.

**Carpet**

According to Carpet America Recovery Efforts (CARE) in 2010, carpet waste diverted from landfills was 338 million pounds, 271 million pounds were recycled, 3 million pounds used for alternative fuel and 23 million pounds for cement kilns. Old carpet is being recycled and used in composite lumber (both decking and sheets), tile backer board, roofing shingles, rail road ties, automotive parts, carpet cushion and stepping stones. A study by Wang et al. (2000) proved that by adding fibers to concrete, both toughness and tensile properties increased. Other benefits in

adding carpet fiber to concrete include reduction of shrinkage, improved fatigue strength, wear resistance and durability.

## Innovation

### Industrial Ecology

Industrial ecology, also referred to as industrial symbiosis, is emerging as a powerful source of innovation in Australia. Industrial ecology promotes enhanced sustainability and resource efficiency by stimulating innovations in the re-use of waste materials. The wastes or by-products of one industry are used as inputs in another industry, thereby closing the material loop of industrial systems and minimising waste.

The Waste Management Association of Australia (WMAA), supported by funding from the New South Wales Office of Environment and Heritage, set up an organisation in 2009 called the Australasian Industrial Ecology Network. This group has been working to promote awareness of industrial ecology, and the opportunities that it creates, through industry events and, more recently, industry workshops where manufacturers can exchange by-products with each other, saving landfill costs and offsetting raw material costs.

These workshops have been held in New South Wales and Melbourne and are sponsored by state and local governments to catalyse innovation and resource efficiency outcomes in their areas. These workshops have been referred to as 'speed-dating workshops' as the focus is on finding an industry match. Often there is a need to change manufacturing processes. Support for this is available through the Australasian Industrial Ecology Network.

### Advantage

Advanced Disposal brings fresh ideas and solutions to the business of a clean environment. As the fourth largest solid waste company in the U.S., we provide integrated, non-hazardous solid waste collection, recycling and disposal services to residential, commercial,

industrial and construction customers across globally. This technique gives sustainable solutions to preserve the environment for future generations.

## Conclusion

Review of several studies suggested that the use of recycled materials has positive impact through different aspects. This include the benefits in enhancing sustainability of the construction industry while reducing cost, providing solutions to environmental pollution and reducing the need for natural resources. In this study, a questionnaire survey was conducted to find out the current practices in using waste and recycled materials in the construction industry. Results indicated that some companies were not aware of the availability, quality of the materials' performance, cost savings, or any other benefits including environmental benefits. It is, thus recommended to create better documentation for green infrastructure, connecting researches and industry with an overview of what recycled materials are available for different construction applications. Companies need to be innovative in their use of recycled materials and reduce their dependency on raw materials. Also, more data and better documentations are needed to encourage the use of waste and recycled materials in the construction industry.

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# Eco Friendly Structures

**S. Suba Bagavathi, M.Phil. Scholar**
**R. Jackson Gunaraj, MBA**

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**Abstract**

Global warming is a serious problem which is faced by the world today as well the world in the future. In order to stop or reverse this problem, society must change; learn to alter i.e. what they should use in order to be less harmful to the environment. Making buildings "Green" would greatly impact this problem. There are many ways for this to be done and more ways are being developed rapidly. As these new developments arise, the cost reward for green building becomes more logical for the consumer. The Global warming is the effect of climate change and felt across the world. Both government and individuals are beginning to take task of building green houses much more seriously. Green building is an opportunity to use the resources efficiently, create healthier building that can improve human health.

**Keywords:** Green Building, Low Carbon Building, Green House Effect, Eco-Friendly Construction.

## Introduction

"Green buildings are a hallmark of economically sound business decisions, thoughtful environmental decisions, and smart human impact decisions."-Rick Fedrizzi

Eco-friendly, or ecological, construction is building a structure that is beneficial or non-harmful to the environment, and resource efficient. Otherwise known as green building, this type of construction is efficient in its use of local and renewable materials, and in the energy required to build it, and the energy generated while being within it.

A green or sustainable building is a building that can maintain or improve:

1. the quality of life and harmonize within the local climate, tradition, culture,
2. the environment in the region,
3. conserve energy, resources and recycling materials,
4. reduce the amount hazardous substances to which human and other organisms are (or may be) exposed and
5. the local and global ecosystem throughout the entire building life-cycle

Green Building is important for the growth and development of our communities has a large impact on our natural environment. The manufacturing, design, construction, and operation of the buildings in which we live and work are responsible for the consumption of many of our natural resources.

**Ideas for Green Home Building**

**Location:** First, avoid building west facing home. This will keep your home cool as it minimizes sun exposure. Secondly, avoid building home in environmentally sensitive locations such as earthquake or hurricane or flood prone areas. Thirdly, check if public transportation is easily available and local grocery shop is not that far away. This will help you avoid taking your own vehicle every time and will reduce your travel time.

**Smaller is Better:** A small home built with eco-friendly techniques is going to have smaller environmental impact as against a large home. A house that is too large is likely to cost more to heat and cool. Try to keep the place manageable and cost effective. If you are planning to extend your family and bring in few relatives, you need to put proper resources and accommodation in place.

**Proper Insulation:** Insulation is one of the most important things that you need to consider while building a green home. Air leaks such as around windows, door and duct work is

responsible for building's heat loss. Don't let heating and cooling of your interior spaces air go waste through improper insulation. Proper insulation will not only reduce your energy consumption but will bring down your electricity bills substantially.

**Reduce, Reuse, and Recycle:** Reduce your need for buying new products that are not environment friendly. Reuse your old material such as wood floors, doors, windows in your next home. Recycled materials such as recycled glass, aluminium, recycled tile, reclaimed lumber, recycled plastic can be used in green home building.

**Use Sustainable Building Materials:** If building a green home is your goal, then using environmentally or eco-friendly products should be on your list which can reduce the impact of construction on the environment. Each and every part of your house such as roofing material, building material, cabinets, counters and insulation to your flooring should be environmentally friendly. Use products such as reclaimed lumber, recycled plastic, recycled glass or natural products such as bamboo, cork and linoleum which are made of natural, renewable materials.

**Install Solar Panels:** Solar energy is clean and renewable source of energy. Solar panels are an emerging and hot technology for people who want to utilize the natural power all around us, the sun. Solar panels may be expensive at first, but the long-term savings you can put into your pocket is a stunning example of the benefits of turning your life from black to green. The location of your house and the way you have constructed solar panels can determine how much power you can collect. By taking advantage of solar power you can bring down your energy consumption and supply excess energy, if any, to your utility company. Also, government grants, incentives and tax breaks are huge bonus to those who want to use solar power in their home.

**Energy Star Windows:** Energy efficient windows labelled as ENERGY STAR windows are new player in window market and are much more energy efficient than normal windows. The ratings for these windows determine how energy efficient they will be. The lower the rating, the

more energy efficient are your windows. The energy savings provided by these windows are enough to cover the added cost per window.

**Rainwater Harvesting Systems:** Install rainwater harvesting system while building your green home to collect rainwater from roofs and then storing it in a tank. The collected water can then be used for other purposes such as toilets and sprinkler systems. Rain barrels are one of the most common methods of rainwater harvesting being used today.

**Eco-Friendly Lighting:** Both LED and CFL cost more upfront but use less energy and last longer than traditional incandescent bulbs. Since they offer significant cost savings in the long run, they can be ideal for your new green home.

**Cost Effective Benefits of Going Green**

- You can eliminate the stress that comes with paying high monthly bills.
- Saving money for other things like trips, special occasions and outings.
- Reducing your carbon footprint.
- Encouraging others in your family to save energy by eliminating the use of certain things during high peak or mid peak hours
- You can put the money you saved to good use, no matter what it is.

**Suggestions**

- Helps to enhance occupant health and comforts
- Improves air and water quality
- Helps to reduce operating costs
- Reduce waste streams

**Conclusion**

Eco-friendly structures have provided more advantage to occupant and environment. It has also created more positive impact on environment condition. Building using sustainable

materials is immensely rewarding. It requires ingenuity and creativity, whilst at the same time providing a sense of well-being and contributing to a better environment, now and for future generation.

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# Safety Management

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**Abstract**

Safety Management System (SMS) is a systematic approach to manage safety, including the necessary organizational structures, accountabilities, policies and procedures. As per International Civil Aviation Organization (ICAO) requirements, service providers are responsible for establishing safety management system, which is accepted and overseen by their State.

Safety Management System, Process Safety Management are recent introductions to our efforts to improve the Environment, Health and Safety. Safety Management Systems were developed based on the concepts of systematic improvement used in Total Quality Management, the Malcolm Baldrige National Quality Award, and Dr.Deming's teachings. As these scientific systems were being implemented in the early nineties, some companies set goals to reduce the number of accidents by 90% in ten years. To accomplish these accident reduction goals, companies had to improve their accident and incident investigation processes to reduce the number of repeat accidents. Therefore, many adopted advanced root cause analysis and techniques were used as part of their Safety Management System.

**Key Words:** Safety Management, Health And Safety, Adopted**.**

## Introduction

Safety management means the management functions connected with the carrying on of an industrial undertaking that relate to the safety of personnel in the undertaking, including – (a)

the planning, developing, organizing and implementing of a safety policy; and (b) the measuring, auditing or reviewing of the performance of those functions.

Construction work is a dangerous land-based job. It includes building houses, roads, workplaces and repairs and maintains infrastructures. This work includes many hazardous task and conditions such as working with height, excavation, noise, dust, power tools and equipment. The most common fatalities are caused by the fatal four. Construction work has been increasing as the result occupational fatalities have increased. Occupational fatalities are individuals that pass way while on the job or performing work related tasks.

In a high-hazard industry like construction, safety is an investment that provides real benefits. A safe work environment helps to keep skilled employees on the job and projects on track by reducing accidents that result in injuries and schedule delays, while also reducing the risks of litigation and regulatory action. A strong safety record enhances a company's reputation, makes it more competitive. Fostering a successful safety culture, however, is a company-wide effort that requires commitment and participation from the chief executive to project managers, superintendents, foremen and individual workers on the job site. That commitment should extend to the selection of subcontractors who also embrace a strong safety ethic.

Safety should be part of the process right from the very beginning. In working toward establishing a safer workplace, construction companies can tap the extensive knowledge of risk management experts who are well versed in their industry.

**Ideas for Job Site Safety**

**Start at the top**

Safety on the job site starts in the executive suite. To have a real impact on workers, safety has to become a core value of the organization. Chief executives should instill the responsibility of safety in every level of management. Too often it is shunted off to the on-site safety manager or corporate safety director. Project executives and managers, superintendents

and foremen should be required to take the necessary training, they should be well versed in accident investigation, substance abuse, conflict resolution, pre-job safety planning, loss analysis and managing subcontractors. A project specific safety manual that outlines safety expectations and criteria should be given to each subcontractor. In addition, subcontractors should be required to submit their own project specific safety plan to identify the scope of their work, how the hazards will be mitigated and what measures they will take to provide a safe work environment.

**Prequalify Subcontractors for Safety**

Companies routinely pre-qualify subcontractors for experience, qualification and financial strength, but safety history and performance should also be criteria. To evaluate subcontractor safety performance, companies should review their experience modification rates, their Bureau of Labor Statistics recordable and lost time incident rates. The pre-qualification of subcontractors should not stop with safety history and performance. It should include a review of the subcontractor's own safety culture and how the company incorporates safety into its day-to-day operation. Subcontractors are responsible for the safety and health of their employees, but also need to ensure they perform their work in a manner that protects the general public.

**Train Workers for Safety**

Workers need to be trained to properly use a variety of safety equipment, such as fall arrest systems, and they need to know the appropriate regulations. Orientation shouldn't be limited to new hires. The company should provide orientation specific to each project. The orientation should include an overview of the project, an in-depth review of the safety requirements and expectations, evacuation plans and procedures, disciplinary actions, substance abuse testing policy and fall management procedures and requirements.

**Evaluate Each Project Phase for Safety**

Planning for safety is a continual process. A job safety task analysis should be performed to make sure that the appropriate work and safety equipment is on hand so that workers aren't tempted to make do with what may be inadequate equipment or take chances that will endanger

their safety. The analysis should include the specific aspects of the work at hand, identification of potential exposures, controls to eliminate the exposures and the necessary safety equipment to perform the work properly. The analysis should be submitted by the supervisor before the start of work and reviewed by the project manager or superintendent along with the supervisor. Supervisors should review it with the crew beforehand. All subcontractors should follow this procedure.

**Make Safety an Everyday Topic**

When foremen gather workers at the beginning of a shift to talk about the day's work, they should review the hazards involved and the safety controls, and make sure that the workers have the right protective gear and that all safety concerns are addressed. If the job changes during the day, construction managers or contractors should review the changes in terms of safety. Weekly meetings with superintendents and subcontractor field management personnel to discuss production-related topics should include a review of any accidents, near misses or safety lapses as well as safety issues related to the coming work. Regular inspections are probably the most effective management tool for dealing with the basic root causes of accidents, such as worn equipment, misplaced tools or equipment or unsafe actions by workers.

**Review Accidents and Near Misses**

Companies should start with the mindset that accidents are not inevitable. In the event that there is an accident, the facts and circumstances should be reviewed to identify root causes so that corrective action can be taken and future incidents can be prevented. The same attention should be paid to near misses that had the potential to become serious accidents. Regular accident review meetings between field managers and executives send a clear message that safety should be paramount. To help manage safety, each project executive should be provided detailed loss runs and claim information. Project executives should participate in claims review meetings with insurers to get first-hand information on the claims in their projects. This helps to make sure the project manager understands the financial implications associated with accidents on the projects as well as the impact on the company's insurance costs.

## Work with Your Insurer and Risk Management Experts

Proactive companies take a collaborative approach to safety with risk management experts and their insurers at every step of the project. Companies should look to their insurers as a resource with substantive expertise in risk management, engineering protocols and procedures to help make their own safety efforts even more robust. An insurer can bring insights learned from different industries and different regions of the country. They can identify best practices for projects in different areas and expand on best practices which might be considered.

## Toward Zero Injuries

When a construction company succeeds in building a strong culture of safety, it becomes a core value for every employee. A strong safety culture burnishes the company's reputation, which is one of the most valuable assets for any business, and plays an essential role in its long-term success. A safer company suffers fewer losses, enjoys lower costs, becomes a more competitive bidder and makes it more attractive to potential clients and insurers. But safety is a job that never ends. The construction industry is always adopting new methods, new equipment and new machinery. Safety has to continually adapt to the new ways that workers are performing their jobs. At the end of the day, every company wants every worker to go home safe at night. The ultimate goal should be zero injuries. By partnering with the right insurer, companies can move closer to that goal.

## Impacts of Good Safety Management

- It improves employee performance. A (good SMS) safe environment encourages employees to be more productive. Employees are more productive, conscientious and have less absenteeism in a good working environment
- It improves regulatory compliance of workers i.e. workers will act in accordance with safety rules and regulations
- Costs from injuries and illnesses are reduced. A good SMS in an organization will prevent/reduce illnesses and injuries
- It encourages good relations between employees in an organization.

- The potential for reduced insurance and liability costs

**Suggestions**

Safety has to be ensured at each phase of job.

- Workers should be trained to use safety equipment.
- Safe work environment enables to reduce accidents and keep skilled employees on the job.

**Conclusion**

Construction work has been increasing in developing and undeveloped countries over the past few years. So it is necessary to have safe constructions sites within the field of construction. Once a projects starts, safety should be a part of employee's job every day. A strong safety program benefits everyone, the company, the employees, stakeholders and regulators.

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# Role of NDMA in Disaster Management – A Study with Reference to India

**C. Bharathi Kannan, PG Scholar**

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**Abstract**

To conceptualize and fix contours and definition of mitigation projects along with the identification and description of the various interventions required. These tasks will be carried out through an inclusive and participatory process involving extensive consultation with the Central Ministries/Departments/State Governments/Union Territories and other stakeholders. To formulate Detailed Project Reports (DPRs) duly describing all the support systems, i.e. financial technical and managerial resources as well as the techno-legal regimes required. For this experts/agencies need to be engaged, on an as required basis in terms of the Government rules and regulations. This paper deals about an role of NDMA in disaster management-A study with reference to India.

**Key Words:** NDMA, Disaster Management, Role of NDMA, NDMA to India

## Introduction

### NDMA

National Disaster Management Authority (NDMA) is an agency of the Ministry of Home Affairs whose primary purpose is to coordinate response to natural or man-made disasters and for capacity-building in disaster resiliency and crisis response. NDMA was established through the Disaster Management Act enacted by the Government of India in December 2005. The Prime Minister is the ex-officio chairperson of NDMA. The agency is responsible for framing policies, laying down guidelines and best-practices and coordinating with the State Disaster Management Authorities (SDMAs) to ensure a holistic and distributed approach to disaster management.

**Disaster Management**

The studying of Natural disasters are:

- Earthquake
- Floods
- Landslides
- Cyclones
- Tsunami
- Urban flood

**Role of NDMA**

The National Disaster Management Authority (NDMA), headed by the Prime Minister of India, is the Apex Body for Disaster Management in India. The setting up of the 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.

**Objectives of the Study**

- To study what is NDMA?
- To study the role of NDMA.
- To study NDMA in disaster management
- To study NDMA with reference to India

**Institutional and Policy Framework**

The institutional and policy mechanisms for carrying out response, relief and rehabilitation have been well-established since Independence. These mechanisms have proved to be robust and effective insofar as response, relief and rehabilitation are concerned. At the national level, the Ministry of Home Affairs is the nodal Ministry for all matters concerning disaster management. The Central Relief Commissioner (CRC) in the Ministry of Home Affairs is the nodal officer to coordinate relief operations for natural disasters.

The CRC receives information relating to forecasting/warning of a natural calamity from India Meteorological Department (IMD) or from Central Water Commission of Ministry of Water Resources on a continuing basis. The Ministries/Departments/Organizations concerned with the primary and secondary functions relating to the management of disasters include: India Meteorological Department, Central Water Commission, Ministry of Home Affairs, Ministry of Defence, Ministry of Finance, Ministry of Rural Development, Ministry of Urban Development, Department of Communications, Ministry of Health, Ministry of Water Resources, Ministry of Petroleum, Department of Agriculture & Cooperation. Ministry of Power, Department of Civil Supplies, Ministry of Railways, Ministry of Information and Broadcasting, Planning Commission, Cabinet Secretariat, Department of Surface Transport, Ministry of Social Justice, Department of Women and Child Development, Ministry of Environment and Forest, Department of Food. Each Ministry/Department/Organization nominates their nodal officer to the Crisis Management Group chaired by Central Relief Commissioner. The nodal officer is 6 responsible for preparing sectoral Action Plan/Emergency Support Function Plan for managing disasters.

**National Crisis Management Committee (NCMC)**

Cabinet Secretary, who is the highest executive officer, heads the NCMC. Secretaries of all the concerned Ministries /Departments as well as organizations are the members of the Committee The NCMC gives direction to the Crisis Management Group as deemed necessary. The Secretary, Ministry of Home Affairs is responsible for ensuring that all developments are brought to the notice of the NCMC promptly. The NCMC can give directions to any Ministry/Department/Organization for specific action needed for meeting the crisis situation.

**Crisis Management Group**

The Central Relief Commissioner in the Ministry of Home Affairs is the Chairman of the CMG, consisting of senior officers (called nodal officers) from various concerned Ministries. The CMG's functions are to review every year contingency plans formulated by

various Ministries/Departments/Organizations in their respective sectors, measures required for dealing with a natural disasters, coordinate the activities of the Central Ministries and the State Governments in relation to disaster preparedness and relief and to obtain information from the nodal officers on measures relating to above. The CMG, in the event of a natural disaster, meets frequently to review the relief operations and extend all possible assistance required by the affected States to overcome the situation effectively. The Resident Commissioner of the affected State is also associated with such meetings.

**Control Room (Emergency Operation Room)**

An Emergency Operations Center (Control Room) exists in the nodal Ministry of Home Affairs, which functions round the clock, to assist the Central Relief Commissioner in the discharge of his duties. The activities of the Control Room include collection and 7 transmission of information concerning natural calamity and relief, keeping close contact with governments of the affected States, interaction with other Central Ministries/Departments/Organizations in connection with relief, maintaining records containing all relevant information relating to action points and contact points in Central Ministries etc., keeping up-to-date details of all concerned officers at the Central and State levels.

**Contingency Action Plan**

A National Contingency Action Plan (CAP) for dealing with contingencies arising in the wake of natural disasters has been formulated by the Government of India and it had been periodically updated. It facilitates the launching of relief operations without delay. The CAP identifies the initiatives required to be taken by various Central Ministries/Departments in the wake of natural calamities, sets down the procedure and determines the focal points in the administrative machinery. 2.7 State Relief Manuals: Each State Government has relief manuals/codes which identify that role of each officer in the State for managing the natural disasters. These are reviewed and updated periodically based on the experience of managing the disasters and the need of the State.

**Funding Mechanisms**

The policy and the funding mechanism for provision of relief assistance to those affected by natural calamities is clearly laid down. These are reviewed by the Finance Commission appointed by the Government of India every five years. The Finance Commission makes recommendation regarding the division of tax and non-tax revenues between the Central and the State Governments and also regarding policy for provision of relief assistance and their share of expenditure thereon. A Calamity Relief Fund (CRF) has been set up in each State as per the recommendations of the Eleventh Finance Commission. The size of the Calamity Relief Fund has been fixed by the 8 Finance Commission after taking into account the expenditure on relief and rehabilitation over the past 10 years.

The Government of India contributes 75% of the corpus of the Calamity Relief Fund in each State. 25% is contributed to by the State. Relief assistance to those affected by natural calamities is granted from the CRF. Overall norms for relief assistance are laid down by a national committee with representatives of States as members. Different States can have State specific norms to be recommended by State level committee under the Chief Secretary. Where the calamity is of such proportion that the funds available in the CRF will not be sufficient for provision of relief, the State seeks assistance from the National Calamity Contingency Fund (NCCF) - a fund created at the Central Government level. When such requests are received, the requirements are assessed by a team from the Central Government and thereafter the assessed requirements are cleared by a High Level Committee chaired by the Deputy Prime Minister.

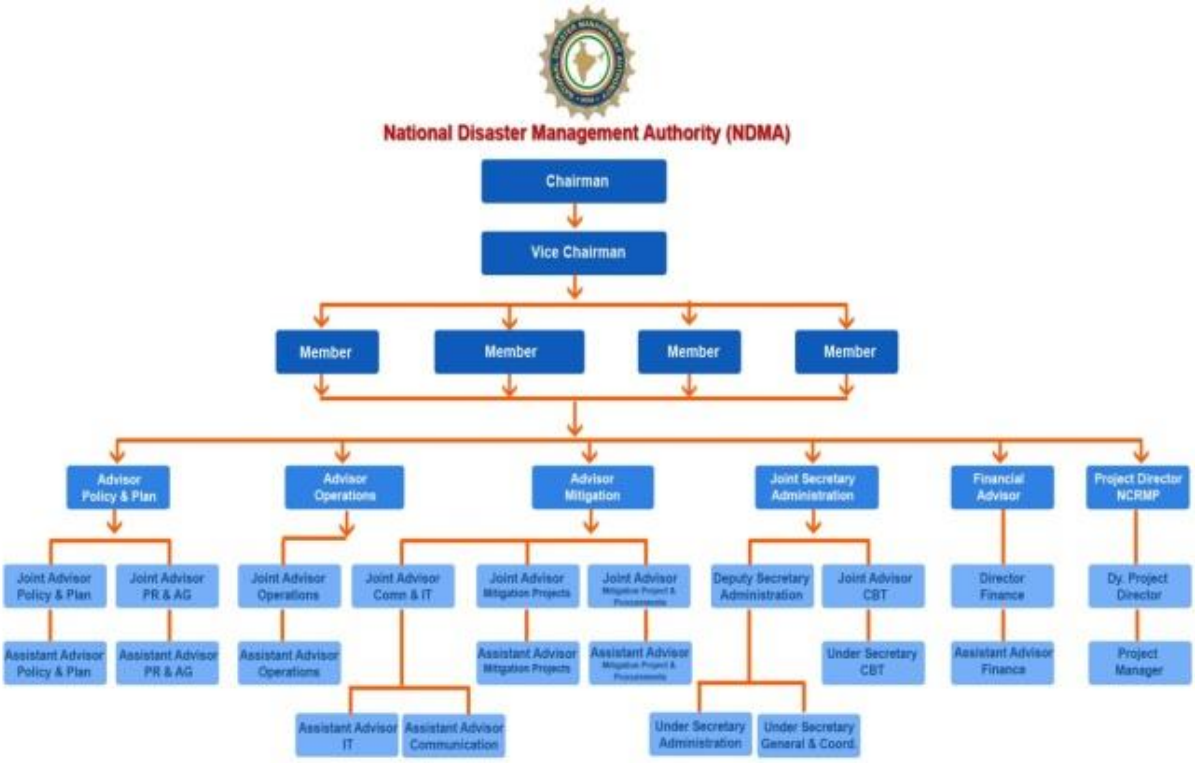
In brief, the institutional arrangements for response and relief are well established and have proved to be robust and effective. In the federal set up of India, the basic responsibility for undertaking rescue, relief and rehabilitation measures in the event of a disaster is that of the State Government concerned. At the State level, response, relief and rehabilitation are handled by Departments of Relief & Rehabilitation. The State Crisis Management Committee set up under the Chairmanship of Chief Secretary who is the highest executive functionary in the State. All the concerned Departments and organisations of the State and Central Government Departments

located in the State are represented in this Committee. This Committee reviews the action taken for response and relief and gives guidelines/directions as necessary. A control room is established under the Relief Commissioner. The control room is in constant touch with the climate monitoring/forecasting agencies and monitors the action being taken by various agencies in performing their responsibilities. The district level is the key level for disaster management and relief activities. The 9 Collector/Dy. Commissioner is the chief administrator in the district. He is the focal point in the preparation of district plans and in directing, supervising and monitoring calamities for relief. A District Level Coordination and Relief Committee is constituted and is headed by the Collector as Chairman with participation of all other related government and non-governmental agencies and departments in addition to the elected representatives. The Collector is required to maintain close liaison with the district and the State Governments as well as the nearest units of Armed Forces/Central police organisations and other relevant Central Government organisations like Ministries of Communications, Water Resources, Drinking Water, Surface Transport, who could supplement the efforts of the district administration in the rescue and relief operations. The efforts of the Government and non-governmental organisations for response and relief and coordinated by the Collector/Dy. Commissioner. The District Magistrate/Collector and Coordination Committee under him reviews preparedness measures prior to a impending hazard and coordinate response when the hazard strikes. As all the Departments of the State Government and district level report to the Collector, there is an effective coordination mechanism ensuring holistic response.

**New Institutional Mechanisms**

As has been made clear above, the existing mechanisms had based on post-disaster relief and rehabilitation and they have proved to be robust and effective mechanisms in addressing these requirements. The changed policy/approach, however, mandates a priority to full disaster aspects of mitigation, prevention and preparedness and new institutional and policy mechanisms are being put in place to address the policy change. It is proposed to constitute a National Emergency Management Authority at the National level. The High Powered Committee on Disaster Management which was set up in August, 1999 and submitted its Report in October,

2001, had inter 10 alia recommended that a separate Department of Disaster Management be set up in the Government of India




## Conclusion

. The organisation at the Apex level will have to be multi-disciplinary with experts covering a large number of branches. The National Emergency Management Authority has, therefore, been proposed as a combined Secretariat/Directorate structure – a structure which will be an integral part of the Government and, therefore, will work with the full authority of the Government while, at the same time, retaining the flexibility of a field organisation. The National Emergency Management Authority will be headed by an officer of the rank of Secretary/Special Secretary to the Government in the Ministry of Home Affairs with Special Secretaries/Additional Secretaries from the Ministries/Departments of Health, Water Resources, Environment & Forests, Agriculture, Railways, Atomic Energy, Defence, Chemicals, Science & Technology,

Telecommunications, Urban Employment and Poverty Alleviation, Rural Development and India Meteorological Department as Members of the Authority. The Authority would meet as often as required and review the status of warning systems, mitigation measures and disaster preparedness. When a disaster strikes, the Authority will coordinate disaster management activities.

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# Business Ideas for Civil Engineers Startup

**R. Dharani, PG Scholar**

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**Abstract**

The entire construction industry is due for a major technological revolution. Because it is an old science, a lot of what happens is happening because "that's how it has been done since long back". If you can disrupt operations, engineering or planning of construction projects by the introduction of technology (as has been done in FMCG, manufacturing and financial sector), it can lead to both you getting very rich as well as rapid developments in construction. But there are reasons why there are very few obvious disruptions in civil engineering - It requires a deep understanding of civil engineering much greater than what is taught in colleges even at post-grad level.

**Keywords:** Technology, Ideas, Financial Implications

## Introduction

The whole industry is very traditional in the sense that you learn most of what you do on the job instead of at college. The risks are very high ! Financial implications of failure are huge, and more often than not lives are at stake if you make big mistakes. As somebody pointed out here, "bugs" in your program can have pretty dire consequences. More often than not, governments are the ultimate clients in big construction projects.

## Objectives of the study

If your clients are archaic, unorganized and do not desire optimization, the value added in short-term by innovation reduces drastically. And short-term is what drives the world! I have gone away too far off the main topic and this answer risks turning into a rant, but it's important to

understand the limitations of any idea before trying to implement it. All that being said, the fact that the industry is primitive and unorganized does provide with some brilliant opportunities to cause disruptions. The amount of money put in infrastructure around the world also makes many ideas in civil engineering hugely scalable. Some ideas which come to mind:

- Automation of execution to achieve much faster turnaround times in construction projects. This is especially applicable to India where construction is painfully slow as compared to the west or even China (I was amazed to know that construction of a huge structure like Millau Viaduct took only 3 years. In India, for such projects, often a year or more can pass even before the full site team and equipment are even mobilized).
- A new material to replace concrete or steel or a new structural concept (like pre stressing introduced in the past by Eugène Freyssinet) can cause a major disruption. But again, significant research is required. A lot of research is already going on in this field though, materials have come up but are not yet feasible to use at a massive scale (eg. Carbon-fiber-reinforced polymer, Fiber-reinforced concrete ). Maybe you can look into some of them for inspiration or further development.
- Innovations in engineering and design space, finding new ways to design structures using the tremendous computation power and technology available. But unless what you do is truly revolutionary, what you will end up doing is only adding value to an already working product in an industry which does not care too much about value-engineering. You can develop tools for existing consultants, but scalability would be a problem there, the market of consultants is simply not large enough. But I believe there is room for are volition here (don't take my word, though. It is loaded with personal bias). My simple tips while thinking of a start-up in civil engineering (you seem like a student to me, I am answering from that perspective) - look for scalability and market size, get an experienced(but preferably not too old or retired) co-founder on board (mostly as the CTO) and do a thorough market study (that means actually meeting your potential clients -plural- and collecting relevant data on current alternatives to what you might be doing) before diving into anything. If you have to compromise on any of these tips, it's better to

work in the industry for a while, gain experience and then come back to your idea…….[1]

**Areas Relevant To Business Idea Mongers for Civil Engineers**

1. Sustainability by designing
2. Rapid construction
3. Solar powered homes and offices
4. Green construction materials: rice husk, fly ash, etc.
5. Automation of execution
6. Innovation in the designs. I am sure, together we can come up some really workable business ideas that those looking for options can take.

**Obvious Disruptions in Civil Engineering**

It requires a deep understanding of civil engineering, much greater than what is taught in colleges even at post-grad level. The whole industry is very traditional in the sense that you learn most of what you do on the job instead of at college. The risks are very high ! Financial implications of failure are huge, and more often than not lives are at stake if you make big mistakes. As somebody pointed out here, "bugs" in your program can have pretty dire consequences. More often than not, governments are the ultimate clients in big construction projects. If your clients are archaic, unorganized and donor desire optimization, the value added in short-term by innovation reduces drastically. And short-term is what drives the world! I have digressed too far off the main topic and this answer risks turning into a rant, but it's important to understand the limitations of any idea before trying to implement it. All that being said, the fact that the industry is primitive and unorganized does provide with some brilliant opportunities to cause disruptions. The amount of money put in infrastructure around the world also makes many ideas in civil engineering hugely scalable. [3].

**Basic Ideas for Startup**

In starting a civil engineering business, one of the first things you must consider is the existing competitors. Determine if you will be able to provide service with higher standards than those of the existing civil engineering businesses. If you are not a civil engineer yourself, consider hiring civil engineers with very good skills in engineering. Your business name and reputation merely rely on the skills of your civil engineers. They represent your business whenever they service a client. Another thing to put into consideration is your budget. Before anything else, think about how much capital you are able to give out. This will help you in determining if you can afford to hire civil engineers who already put up a good reputation or not. Also your capital will play an important role in searching for your business location or office. Your office should have the usual front desk just like any other businesses to entertain your clients' inquiries. You should also be able to provide a showroom to show your clients with the sample accomplishments of your civil engineers. Use digital cameras to telephotograph of the buildings your civil engineers have designed if there are any.

Insurance is also a thing to think about. Since you are dealing with professional services, shop around for insurance companies who provide professional liability insurance. Shopping around will help you in choosing which insurance company provides the best professional liability insurance policy. If you are still having difficulties in determining which insurance company you would choose, consult an expert. Consult an owner of the same line of business; it does not necessarily need to be a civil engineering business too. Since they have already put up their own business, assume that they already have experienced what you are doing right now and you should ask for recommendations on which insurance company provides the best plan that will go well with your civil engineering business.

## Conclusion

But never seek advice from your future competitors; do not expect them to give you a considerable piece of advice because that will be the last thing they want to do unless they want their business to have good competitor, you. Also, put into consideration what sub-discipline of

civil engineering you will be having area of specialization in. This will give you an advantage over your future competitors. The following are some of the sub-discipline of civil engineering:

- Coastal engineering – this mainly deals with the techniques on how to prevent erosions and floods in areas near the seas.
- Earthquake engineering – this pertains to the capacity of a structure to survive an earthquake.
- Environmental engineering – deals with the biological and chemical waste management of certain structure.
- Transportation engineering – this deal with the transportation of people and goods across places efficiently.
- Structural engineering – this concerns the scheming of structures such as buildings, bridges, tunnels, and flyovers. [2].

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# A Study about Advanced Waste Management

**S. Dhinesh Kumar, PG Scholar**

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**Abstract**

Increasing solid waste management problems and its disposal strikes environment and health hazards. This training material covers the essential elements of solid waste management in Asian context. Prevailing scenario of waste handling practices and disposal is exhibited along with its associated problems. Valuable case studies are also discussed. An integrated solid waste management in sustainable approach is presented as a response to necessary waste management strategy needs. Waste minimization in the form of proper waste segregation and utilization, the importance of pre-treatment of organic waste and combustible waste fraction does not only manage the waste but also generates products such as compost and renewable energy. Direct land filling of commingled waste in Asian countries should be discouraged due to its high organic waste fraction which causes potential environmental emissions. The efforts of government to solve this problem from legal aspects through laws and regulations should be supported by an active participation of community, public and private agencies.

**Key Words:** Solid Waste Management, Urban Environment, Individual Field Visit, Photographic Evidence.

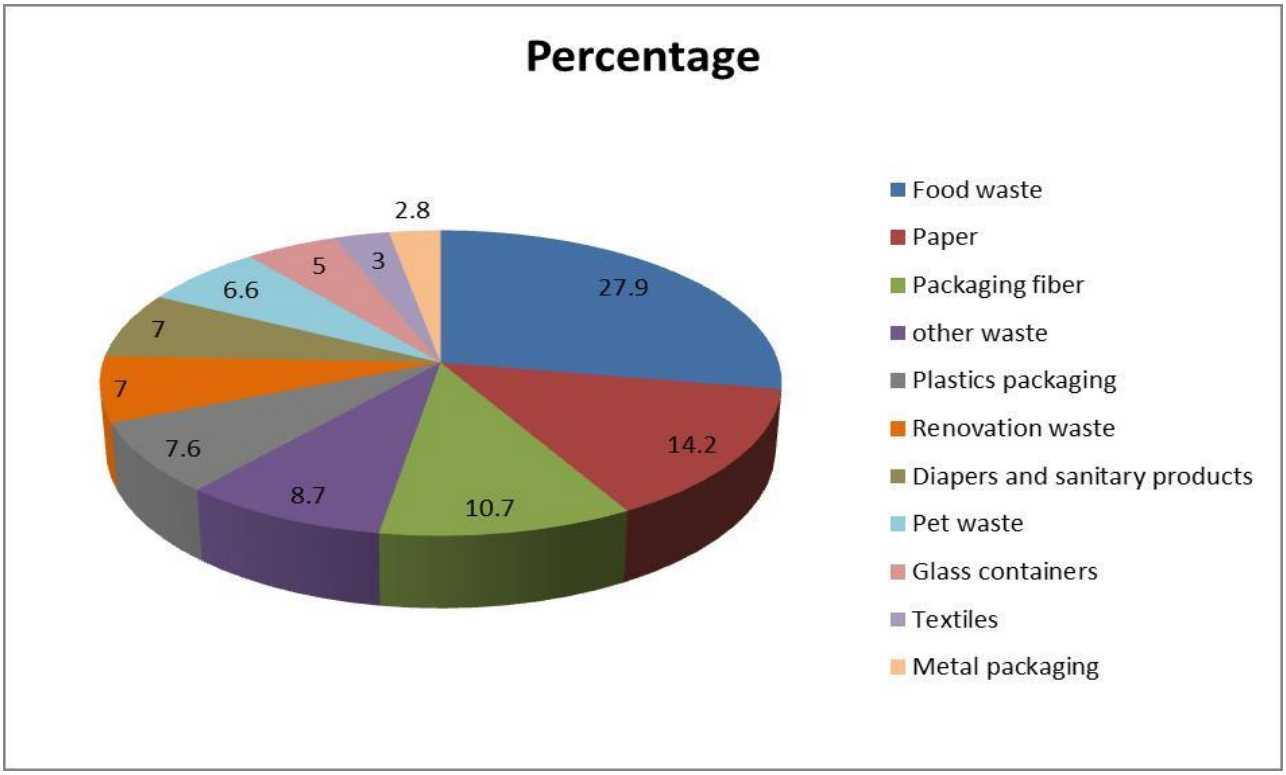
## Waste Management

Waste management is all the activities and actions required to manage waste from its inception to its final disposal.[1] This includes amongst other things, collection, transport, treatment and disposal of waste together with monitoring and regulation. It also encompasses the legal and regulatory framework that relates to waste management encompassing guidance on recycling etc.

The term usually relates to all kinds of waste, whether generated during the extraction of raw materials, the processing of raw materials into intermediate and final products, the consumption of final products, or other human activities,[1]including municipal (residential, institutional, commercial), agricultural, and social (health care, household hazardous wastes, sewage sludge). Waste management is intended to reduce adverse effects of waste on health, the environment or aesthetics.

**Contents of the Solid Waste Stream**

Most people do not spend time wondering about what types of materials they throw away or what exactly comprises a garbage truck's contents. But if you were to ask someone what category of material might make up the biggest portion of the truck's contents, you would probably get many different responses. Perceptions of the makeup, or characterization, of the solid waste stream are affected by many factors, including personal consumption, media reports, and visual impressions of litter and overflowing trash cans. The EPA and other government agencies periodically compile data on the contents of our national municipal solid waste (MSW)stream. Figure 1 summarizes key information from a 1996 EPA report that provides data about the characterization of U.S. MSW broken down by products and material.

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**Methods of Waste Disposal**

**Landfill**

The Landfill is the most popularly used method of waste disposal used today. This process of waste disposal focuses attention on burying the waste in the land. Landfills are found in all areas. There is a process used that eliminates the odors and dangers of waste before it is placed into the ground. While it is true this is the most popular form of waste disposal it is certainly far from the only procedure and one that may also bring with it an assortment of space.

This method is becoming less these days although, thanks to the lack of space available and the strong presence of methane and other landfill gases, both of which can cause numerous contamination problems. Many areas are reconsidering the use of landfills.

**Incineration/Combustion**

Incineration or combustion is a type disposal method in which municipal solid wastes are burned at high temperatures so as as to convert them into residue and gaseous products. The biggest advantage of this type of method is that it can reduce the volume of solid waste to 20 to 30 percent of the original volume, decreases the space they take up and reduce the stress on landfills. This process is also known as thermal treatment where solid waste materials are converted by Incinerators into heat, gas, steam and ash. Incineration is something that is very in countries where landfill space is no longer available, which includes Japan.

**Plasma Gasification**

Plasma gasification is another form of waste management. Plasma is a primarily an electrically charged or a highly ionized gas. Lighting is one type of plasma which produces temperatures that exceed 12,600 °F . With this method of waste disposal, a vessel uses characteristic plasma torches operating at +10,000 °F which is creating a gasification zone till 3,000 °F for the conversion of solid or liquid wastes into a syngas.

During the treatment solid waste by plasma gasification, the waste's molecular bonds are broken down as result of the intense heat in the vessels and the elemental components. Thanks to this process, destruction of waste and dangerous materials is found. This form of waste disposal provides renewable energy and an assortment of other fantastic benefits.

**Composting**

Composting is a easy and natural bio-degradation process that takes organic wastes i.e. remains of plants and garden and kitchen waste and turns into nutrient rich food for your plants. Composting, normally used for organic farming, occurs by allowing organic materials to sit in one place for months until microbes decompose it. Composting is one of the best method of waste disposal as it can turn unsafe organic products into safe compost. On the other side, it is slow process and takes lot of space.

**Waste to Energy (Recover Energy)**

Waste to energy process involves converting of non-recyclable waste items into useable heat, electricity, or fuel through a variety of processes. This type of source of energy is a renewable energy source as non-recyclable waste can be used over and over again to create energy. It can also help to reduce carbon emissions by offsetting the need for energy from fossil sources. Waste-to-Energy, also widely recognized by its acronym is the generation of energy in the form of heat or electricity from waste.

**Reduce, Reuse, Recycle**

Methods of waste reduction, waste reuse and recycling are the preferred options when managing waste. There are many environmental benefits that can be derived from the use of these methods. They reduce or prevent greenhouse gas emissions, reduce the release of pollutants, conserve resources, save energy and reduce the demand for waste treatment technology and landfill space. Therefore, it is advisable that these methods be adopted and incorporated as part of the waste management plan.

**Waste Reduction and Reuse**

Waste reduction and reuse of products are both methods of waste prevention. They eliminate the production of waste at the source of usual generation and reduce the demands for large scale treatment and disposal facilities. Methods of waste reduction include manufacturing products with less packaging, encouraging customers to bring their own reusable bags for packaging, encouraging the public to choose reusable products such as cloth napkins and reusable plastic and glass containers, backyard composting and sharing and donating any unwanted items rather than discarding them. All of the methods of waste prevention mentioned require public participation. In order to get the public onboard, training and educational programmers need to be undertaken to educate the public about their role in the process. Also the government may need to regulate the types and amount of packaging used by manufacturers and make the reuse of shopping bags mandatory.

**Recycling**

Recycling refers to the removal of items from the waste stream to be used as raw materials in the manufacture of new products. Thus from this definition recycling occurs in three phases: first the waste is sorted and recyclables collected, the recyclables are used to create raw materials. These raw materials are then used in the production of new products. The sorting of recyclables may be done at the source (i.e. within the household or office) for selective collection by the municipality or to be dropped off by the waste producer at a recycling centers.

The pre-sorting at the source requires public participation which may not be forthcoming if there are no benefits to be derived. Also a system of selective collection by the government can be costly. It would require more frequent circulation of trucks within a neighborhood or the importation of more vehicles to facilitate the collection. Another option is to mix the recyclables with the general waste stream for collection and then sorting and recovery of the recyclable materials can be performed by the municipality at a suitable site. The disadvantage however, is that the value of the recyclable materials is reduced since being mixed in and compacted with other garbage can have adverse effects on the quality of the recyclable material

**Classifications for Hazardous Materials**

Many hazardous materials may fall into more than one category. Descriptions of the hazards posed by these materials are classified into seven basic types:

Flammable/Combustible—ignites easily and burns rapidly.

- Explosive/Reactive—explosive chemicals produce a sudden, almost instantaneous release of pressure, gas, and heat when subjected to abrupt shock, high temperature, or an ignition source; reactive chemicals vigorously undergo a chemical change under conditions of shock, pressure, or temperature.
- Sensitizer—on first exposure causes little or no reaction in humans or test animals; but on repeated exposure may cause a marked response not necessarily limited to the contact site. Skin sensitization is the most common form; respiratory sensitization to a few chemicals also occurs.

- Corrosive—causes visible destruction of or irreversible alterations in living tissue by chemical action at the site of contact.

**Labels for Associated Risks**

By law, hazardous products must bear labels that explain the hazards associated with them and how to prevent injury or damage. The following signal words determined by law express the relative risk associated with a product.

- No signal word—relatively nonhazardous
- Caution or Warning—generally mildly to moderately hazardous or toxic; can cause temporary adverse health effects, such as skin irritation or vomiting
- Danger—more severely hazardous or toxic; can cause permanent serious health effects, such as skin burns or stomach ulcers
- Poison—highly toxic; can be fatal if ingested The term "nontoxic" is an advertising word that has no legal meaning except when used to describe art supplies.

**Conclusion**

The effect that waste has on our natural environment and ultimately on the quality of our life has been made public in worldwide debates. The problems related to waste have many dimensions. In economically challenged communities, the scope and magnitude of the problem may often exceed the capacity that local authorities have to effectively resolve issues of waste collection and disposal, in addition to other difficult city managerial tasks. In the 1950's the influence of human activities on the natural environment became more evident to scholars. Urban ecology theory embodies the idea that human influence on the natural environment has evolved into an integrated field in which scientists look at solving problems in regard to nature in cities by using different tools. Bearing in mind the complexity of nature and cities, the ecological conditions of urban areas are viewed as the necessary measures for environmental protection and recovery. Land, water, vegetation and other living organisms fill cities and interact with people. In consequence their protection and care reflect upon the quality of human life. There are several factors related to improving ecological conditions in cities. Environmental benefits are noticeable

through the reduction of pollutants, since consequences of air contamination are both local and global. Another parameter is to preserve the natural condition of land and its ability to sustain life. Also accessibility to clean water supports not only the existence of all living organisms but also contributes heavily to production processes, irrigation and transportation purposes.

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# An Organizational Study About Green Environment

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**Abstract**

In high-risk organizations much effort has been made to regulate techniques in order to reform human action, for the reduction of risk and increasing productivity. The purpose of using IT-based Safety Management System is to code and share best practices, create corporate knowledge directories and to create knowledge networks for organizations. The aim for this paper is to give a review of relevant safety literature and come to a combining definition of what challenges with using Safety Management Systems. Usually these procedures are distributed throughout the organization via an internal computer network, an intranet, where (hopefully) all employees can access the necessary documents. A central argument in this paper is that the concept of analysis has been neglected in the safety literature, and that Safety Management Systems should be analysed as a part of an organisations communication. The Safety Management System is made at an executive level in the organization and distributed to the lower levels, and at the lower levels, it must be interpreted by the users. There is no guarantee that it will be interpreted as intended. In the development and implementation phases Safety Management Systems in professional organizations the emphasis has often been mainly on the technical requirements, but more care should be given to the social and cultural facets of knowledge management

**Key Words**: Safety Management System, Communication, Procedures, Interpretation, Culture.

## Introduction

In the energy industry, and in other industries operating in a hazardous environment, there has been a development towards controlling the daily workflow through various forms of management systems. Within the various industrial organizations the management systems contain different things. In some organizations they mainly contain procedures for operations at the sharp end, whilst in other organizations the management system also contains procedures on blunt end operations, such as administrating over-time, hiring new staff and ordering new equipment. Also the research literature stems from various academic disciplines, with organizational science and safety science as the two most predominant ones.

In both the academic literature and in the industry these systems are given different terms, with Safety Management System, Information System and Knowledge System as the most common ones, although someone also uses the terms Knowledge Management System and Information Management System, or even Managing Information System.

These terms are somewhat overlapping, but also different. There is no clear consensus within the research literature as to exactly what the different terms means. Hence, two different researchers might use the term Safety Management System in a slightly different manner. The papers reviewed usually don`t go deep into discussions about definitions. The approach is more pragmatic, with focus on advantages and disadvantages with using management systems, and on why the workers so often aren`t using the management system the way it was intended. Papers within the organizational research often focus on the communication aspects, while the papers within the safety research focuses more on the purpose of the management system, which is to reduce the number accidents and unwanted incidents in industries where the effects of accidents can be catastrophically, like air traffic control, nuclear power plants and gas and petroleum production.

The aim for this paper is to through a review of relevant safety literature come to a unifying definition of what an IT-based Safety Management System is, describe the purpose of such systems and challenges with using Safety Management Systems. A central argument in this

paper is that the concept of interpretation has been neglected in the safety literature, and that Safety Management Systems should be analysed as a part of an organisations mediated internal communication.

**Definitions of Management System**

In the various definitions used in the research literature, we find certain common features, whether they are labelled Management System, Information System or Knowledge System. They are all IT-based superstructures, or umbrellas, containing procedures, descriptions and checklists on how different tasks should be performed, and what kind of safety standards different tasks require. Usually these procedures are disseminated throughout the organization via an internal computer network, an intranet, where (hopefully) all employees can access the necessary documents.

**Knowledge Management System**

This term is mostly used within organizational theory. Knowledge management refers to identifying and gathering the collective knowledge in an organization, and hence, a Knowledge Management System is by Alavi and Leidner defined as a "class of information system applied to managing organizational knowledge" (2001, 114). They further explain that knowledge management systems are IT-based, and are developed to support the organization in creating, storing and retrieving knowledge. Building on Davenport and Prusak (1998), they state that knowledge management is about making knowledge visible, to develop a knowledge-intensive culture and to build a knowledge infrastructure, which they state is not only a technological system, but a web of connections where people are given the space and the time to interact and collaborate (Alavi and Leidner 2001). The notion that these systems are not merely technological systems, but socio-technical systems, is shared by many researchers. A related term from safety science is Active Knowledge Support in Integrated Operations (Norheim and Fjellheim 2007), defined as "a socio-technical system for knowledge transfer between drilling projects, trough documented experiences, best practices, and expert references" (ibid, 2). This definition is linked to petroleum industry, but is applicable to other industries as well, as it is point out at the general

idea is to provide decision makers with the best available knowledge, and to facilitate for feedback to capture new knowledge and to delete obsolete knowledge.

**Information System**

In the research literature there doesn`t seem to be a general agreement what an Information System is, but in the organizational literature it is often given similar definitions as Knowledge Management System. One definition is "an open system capturing, contribute to the cognitive tasks in a social/organizational setting" (Avgerou 1987, 135). This is a rather broad definition, and Avgerou goes further to discuss how an information system is embedded in a social and organizational environment, hence establishing the idea that an information system involves more than just building a complicated software system (Avgerou 1987). One might define Information Systems by its purpose, which is to "support and augment organizational knowledge and enhance knowledge management activities by the individual and the collective" (Alavi and Leidner 2001, 115). They too point out that although this is computer mediated communication, an Information System must be rooted in and guided by an understanding of the nature and types of organizational knowledge in order to succeed.

**Safety Management System**

An often cited definition within the safety literature is that safety management relates to the actual practices, roles and functions associated with remaining safe (Kirwan 1998). A similar definition of safety management is that it is "the policies, strategies, procedures and activities implemented or followed by the management of an organization targeting safety of their employees" (Vinodkumar and Bhasi 2011). Safety Management System is hence a formalized way of dealing with these practices, roles, policies and procedures. Safety Management System is defined in various ways in the safety literature. Some definitions are rather formally descriptive, for instance "an organisation's formal arrangement, through the provision of policies, resources and processes, to ensure the safety of its work activity" (El Koursi, Mitra and Bearfield 2007, 4), or, more generally, as "a manifestation of the organization`s safety culture" (Fernández-Muñiz, Montes-Peón and Vázquez-Ordás 2007).

A Portuguese study within the organizational research a slightly different term is used, but the definition is similar: A Occupational Health and Safety Management System is here defined as "a set of tools that enhance safety risk management efficiency related to all the organization`s work activities" (Santos, Barros, Mendes and Lopes 2013, 29).

They describe it as a self-regulatory regime and as a tool to promote and develop health and safety conditions, in which the purpose is to ensure that all work performed in the organization is in accordance with legal obligations. Another definition from the safety literature points to the place of the Safety Management System in the organization; as an integrated mechanism of the organization, and to the purpose of the system; to control the hazards that can affect workers' health and safety (Vinodkumar and Bhasi 2011). A similar definition stems from the United Kingdom Civil Aviation Authority (UKCAA). They define Safety Management Systems as a "methodology by which a company manages safety throughout its organization, utilizing a systematic approach to ensure that all parts of its business are addressed and that all risks are identified and subsequently managed" (UKCAA 2002, as quoted in Chen and Chen 2012).

The International Labour Office defines Safety Management Systems as "a set of interrelated or interacting elements to establish safety policy and objectives, and to achieve those objectives" (ILU 2001, as quoted in Bottani, Monica and Vignali 2009, 155). To sum up these various definitions we can gather that Safety Management Systems are IT-based superstructures containing procedures, descriptions and checklists on how different tasks should be performed according to official regulations, safety standards and corporate values. They are socio-technical systems of which the purpose is to support the organization in creating, storing and retrieving knowledge.

## The Purpose of a Safety Management System

It is easier to find a consensus in the literature when it comes to describing the purpose of the various management systems, which is of course to reduce accidents and risk by

standardizing the work procedures, though the phrasing differs. Santos-Reyes & Beard label it "The Systematic Safety Management System (SSMS)", but the purpose of it is similar; to maintain risk within an acceptable range in the operations of any organization (Santos-Reyes and Beard 2009), which is basically the same as to help the organization identify and manage risk effectively (Koursi, Mitra and Bearfield 2007). Several researchers also underline another purpose of Safety Management Systems, which is to help the organization meet the regulatory requirements (Hale, Heming, Catfhey and Kirwan, 1997; Koursi, Mitra and Bearfield 2007; Antonsen, Almklov and Fenstad 2008; Chen and Chen 2012).

There is also a general agreement that Safety Management Systems is a means to change safety management from being reactive to being proactive (Liou, Yen and Tzeng 2008), and anticipating hazardous situations before they occur, and not just acting after an accident has occurred, or phrased differently; to protect against human error (Dien 1998; Dekker 2003; Antonsen 2009).

There is also the matter of defining legal responsibility if incidents should occur (Antonsen, Almklov and Fenstad 2008). Antonsen (2009) describes how the interest for Safety Management Systems came as a consequence of the increased focus on the organizational conditions for safety in the 1980s. An important assumption was that accidents are mainly caused by human error or failure. Hence, the way to decrease the chance for human error and making the organization operate safer is by creating management systems that specifies objectives, distributes responsibility, plans, organize and controls according to safety precautions (Antonsen 2009, 9). This is not only a matter of coordinating between tasks, but also the accumulation and diffusion of organizational experience, and to turn tacit knowledge into explicit and shared knowledge (Haavik 2010).

In any organization there will always be tacit knowledge, and much effort is made in order to turn tacit knowledge into explicit and shared knowledge, and to make invisible work processes visible and transparent. If those who actually perform the work are the only ones who

knows how it is done, the ability to account for this invisible work and the tacit knowledge that accompanies it, can strengthen the organization`s performance significantly (Haavik 2010). However, tacit knowledge can be so complex that it is difficult to articulate in a way that makes sense, and many professions demand a certain experience in order to be able to make complex considerations (Sohlberg 2009). This is not to say that tacit knowledge needs to remain tacit. Tacit knowledge is "the personal knowledge that is learned through extended periods of experiencing and doing a task, during which the individual develops a feel for and a capacity to make intuitive judgments about the successful execution of the activity" (Choo 2001).

This type of knowledge can also be made explicit and brought forward to other workers who lack the experience, which the management system is an attempt to systematize. This way the separating lines between tacit and explicit knowledge will be moved, so that knowledge that was tacit yesterday is explicit today (Sohlberg 2009). So, the purpose is to increase safety by decreasing the chance for human error and by making sure that regulatory requirements are met at all times, but also to define legal responsibility if incidents occur, and to build a stronger organization by accumulating organizational knowledge.

**Safety Management System and Procedures**

IT-based Safety Management Systems contains a lot of procedures covering various work operations. Procedures are often constructed on the basis of analysing accidents and other unwanted incidents, but also on the already established routines, and on legal demands set by the authorities. Procedures delivers formalized methods for carrying out tasks, such as checklist, task list, action steps, instruction manual, fault- finding heuristic, forms to be completed (Bellamy et al 2010). Procedures are usually seen as protective mechanism against human error, but can also be seen resources to facilitate situational decision making.

In the research literature much focus has been on managing maintenance activities in hazardous environments, where routine tasks need to be performed under changing circumstances. Humans make mistakes, so rules and procedures are designed to control these

human characteristics, and hence improve the reliability of humans and organizations, particularly in safety-critical organizations (Reiman 2011).

Thus, procedures might become rather restrictive. However, several researchers have pointed out that people do not always follow procedures (Lawton 1998; Dekker 2003; McDonald 2006; Antonsen 2009; Reiman 2011). Dekker (2003) gives an account for two different models of thinking about procedures. The first model is where procedures are seen of as the best thought-out and safest way to carry out a job. According to this model, safety comes from people following procedures in as a simple rule-based activity. In the second model, procedures are seen as resources for action.

The do not specify all circumstances to which they apply, and in dynamic workplaces procedures can help people to structure activities across similar but subtly different situations (Schuman, 1987, as referred to in Dekker, 2003). Doing this successfully can be a "substantive and skilful cognitive activity" and safety is a result of "people being skilful at judging when (and when not) and how to adapt procedures to local circumstances" (Dekker, 2003, p. 235). The challenges with using IT-based Safety Management Systems are quite similar to the challenges of using procedures, and includes time pressure, lack of flexibility, a sense that there are better and quicker ways to get the job done, but is also linked to the workers image of themselves as professionals. A lack of flexibility and information overload can also lead to situations where the workers are not able to interpret the procedures and adjust them to the situation at hand.

**Challenges with Using Safety Management Systems**

Several researchers argue that management systems have helped to reduce accident rates by the principle of prevention (Santos et al 2013), while others stress that the literature in this area is lacking, and that there is little research evidence that safety management practices are related to safety performance (Vinodkumara and Bhasi 2010). Any Safety Management System in itself says little about how policies and procedures are carried out in the field (Mearns, Whitaker and Flin 2003), and Safety Management Systems do not always improve the results of

safety because they are centred exclusively on the technical requirements and on obtaining short-term results (Weinstein 1996). Clearly, any organization needs to share experiences and best practices, and to administrate this in an effective way, but to get the acceptance from management and staff to use the tools in practice demands a lot of energy from managers and staff who will have to change their working patterns and habits, without losing tempo on the daily operations. Safety Management Systems are based on the assumption that people will follow the procedures most of the time, but why do workers so often avoid using the Safety Management System?

**The Worker's Ideals of Professionalism**

In a study of UK railway workers motives for rule violations, Lawton found that a well-intentioned desire to get the job done often resulted in deliberated deviations from the written rules. The most important reasons for non-compliant behaviour was a quicker way of getting the job done, but also self-imposed or external pressure to get the job done more efficiently (Lawton 1998). This may also have symbolic value for the workers` image of themselves as professionals. Not only deadlines, but also peer pressure and professional expectations can make violations become compliant behaviour. When unofficial action yields better, quicker ways to do the job, it also functions as a sign of competence and expertise. Being able to outsmart hierarchical control and compensate for higher-level organizational deficiencies or ignorance becomes a part of one's professionalism (Dekker 2003; Hollnagel 2004; 2009; Reiman 2011).

McDonald (2006) notes how the technicians doing aircraft maintenance justified their violation from procedures by reporting there were 'better, quicker, even safer ways of doing the task than following the manual to the letter' (McDonald 2006, 161). The technicians often see this as a part of their professionalism, and as something that compensates for organizational dysfunction. Rules and procedures can be a source of tension for the personnel, afraid of losing their professional identities as skilled craftsmen and becoming "a small cog in a big machine" (Reiman and Oedewald 2006). They often value the use of one`s own judgement and being confident in one`s own abilities to solve problems, and not just following rules (McDonald

2006). This can be seen as a version of the tradition of valuing common sense over paperwork. Borys (2009) found that paperwork became a ritual for the workers, something they did to abide to the company`s rhetoric about safety, but thought that their own common sense was more significant in order to keep them safe. Managers, on the other hand, valued the paperwork related to risk-awareness because it gave them evidence that workers have thought about risk (Borys 2009).

**Lack of Flexibility**

Safety Management Systems and procedures contains a lot of "do not". They are often designed with the intent to prohibit actions that may create hazardous situations, and as a result have a tendency to become increasingly restrictive (Antonsen 2009). Extensive rules and procedures might be at the expense of flexibility, so it is important to balance the need for standardization and the need for flexibility (MacDonald 2006; Grote et al 2009; Sutcliffe 2011). In a context of limited resources, multiple goals, and time pressure it can sometimes be impossible to follow all the rules and get the job done at the same time (Dekker 2003). Some studies also indicate that the workers will more often violate procedures that are seen as overly detailed restrictions (Antonsen, Almklov and Fenstad 2008).

Standardization can also lead to an over-reliance, meaning that the workers trust the standardized procedures blindly and never question whether this really is the best way of doing the job (Grote et al 2009). The question of just about how detailed procedures need to be can probably never be given one general answer. It depends on the nature of the tasks involved, among other things. Tasks that are performed rarely, or are quite complex or require coordination between several units in the organisation, will usually need more detailed descriptions than routine tasks that the workers are quite familiar with, which can be governed by more general functional requirements (Antonsen, Almklov and Fenstad 2008).

Strongly regulated organisations are likely to benefit from it safety-wise if they manage to create some space for individual decision making. Reiman refers to Bourrier`s (1996)

demonstration of how ever expanding procedures did not support individual decision making on behalf of the workers, and that local adjustments of rules and regulations is necessary for organizations to effectively pursue their goals (Reiman 2010). If workers only follow rules, and are not able to decide when the procedures should be adapted according to a specific context, they can get blamed for their inflexibility (Dekker 2003).

## Conclusion

We have works is predominantly an 'unsafe act minimiser', given the predominant safe person focus, although there is an overlap with the 'traditional design and engineering' type evident in the introduction of engineering control measures. The key health and safety roles are assumed by supervisors and the 'safety supervisors' (health and safety representatives). The involvement of health and safety representatives is based on a belief that the elected health and safety representatives should undertake tasks normally undertaken by management representatives. They are not involved in joint problem-solving activity with managers and supervisors. Their activity revolves around a traditional health and safety committee.

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# A Detailed Study on Managing Corporate Social Responsibility and Customer Relationship Management in Public Banking Sector with Reference to Madurai District

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**Abstract**

Corporate Social Responsibility management can be defined as intervention planned to increase the force of Corporate Social Responsibility in the administrative center. These can have a human being focus; aimed at raising an individual's ability to cope with Corporate Social Responsibility and the implementation of the CRM is essential to establish a better performance of the Banking sector. Since managing Corporate Social Responsibility and customer Relationship Management is becoming crucial in the field of management the work has forecasted it in a wide range of dimension. This paper organizes few preliminary concepts of Corporate Social Responsibility and critically analyzes the CRM strategy implemented by banking sector. Hence the employees of the Banking Industry have been asked to give their opinion about the CRM strategy adopted by Banks. In order to provide the background of the employees, the profile of the employees has been discussed initially. The profile of the employees along with their opinion on the CRM practices adopted at Banking Industries has been discussed. Our work progress with consideration of two main parameters change and damage to which Corporate Social Responsibility mainly respond also the paper envelopes certain valuable Corporate Social Responsibility management tactics and techniques that are especially supportive for people who have working are with banking sector. Also an attempt to diagnose the impact of underside Corporate Social Responsibility of day today life in mounting a bigger level Corporate Social Responsibility upon the employees has been made. Further

development have been made with a detailed parametric analysis of employee Corporate Social Responsibility conducted with the wide range of key parameters and several round of experiments has been conducted with techniques as Kolmogorow-Smirnov test., Gratter Ranking, Anova, the work ensures to pay way for an accurate measure in customer handling.

**Key Words:** Customer Relationship, Bank Employee, job Corporate Social Responsibility , causes of Corporate Social Responsibility , attributes initiatives, disagreement, illness and banking sector.

## Introduction

The implementation of the CRM is essential to establish a better performance of the Banking Industry and to increase Corporate Social Responsibility among employees. The present study critically analyzes the CRM strategy implemented by Banking Industry and find out the Corporate Social Responsibility level of employees. Hence the employees of the Banking Industry have been asked to give their opinion about the CRM strategy adopted by Banks. In order to provide the background of the employees, the profile of the employees has been discussed initially. In this research article, the profile of the employees and their opinion on the CRM practices adopted at Banking Industry has been discussed. The article deals with the systematic presentation of analyzed data followed by the interpretation of data. Statistical analysis of data enables researchers to organize, evaluate, interpret, summarize and communicate numeric information. Descriptive statistics is used to describe data and inferential statistics to draw inferences about a population based on collected sample data.

Banking Sector has not only been playing a leading role within the financial system in India but also has a significant socio-economic function, making intruding into the interiors of the economy and is being considered as one of the fast developing areas in the Indian Financial sector too.

Customer service is an integral part of Banking Industry but also while handling the number of customer the Corporate Social Responsibility level will automatically increases. It is the duty of research to go in depth study to identify the key success factors in Banking Industry, in terms of Corporate Social Responsibility level of the employees so as to survive in intense competition and increase the market share.

CRM is a customer focused business strategy that aims to increase customer satisfaction and customer loyalty by offering a more responsive and customer service to each customer. CRM is about managing customers for better understanding and to serve them. Keeping the importance of CRM and its service excellence in view, this study is an attempt to analyze management of the customer relationship in Banking sector particularly, Banking Industry of India (Banks) in Madurai district of Tamil Nadu.

**Objectives**

- To examine the relationship in between employee's with Corporate Social Responsibility and their involvement in organizational works which in turns in CRM.
- To examine and understand how the employees know about CRM strategy in Bank.
- To analysis the most important category of customers approaching the employees
- To analysis the Satisfaction level of the customer services provided by Banking Industry and find out the Occupational Status of the Employees
    - To find out and analysis the Opinion about the CRM System in an Integral Part of the Work in Banks
    - To analysis and find out Corporate Social Responsibility level while Solving the problem of the Account holders and Clearing the Doubts of the Account holders regarding loan Details and other operations

## Literature Review

A number of researchers have defined Corporate Social Responsibility in different words such as, Kazmi, Amjad, and Khan, 2008 have defined Corporate Social Responsibility as "a change in one's physical or mental state, in other words disturbance or imbalance from normal state. Corporate Social Responsibility is caused disturbed events in work environment, social environment, and in routine life (work, family and social life) and also caused by emotional, psychological, mental and physical illness". Moreover, "Corporate Social Responsibility comes from any situation or circumstance that require behavioral adjustment any change either good or bad is Corporate Social Responsibility ful or whether it's positive or negative change, the physiological response is same" (W. Colligan and M.Higgins, 2010).

Job Corporate Social Responsibility can arise from different environment of work like organizational or situational Corporate Social Responsibility it is from the characteristics of the workers themselves, i.e., dispositional Corporate Social Responsibility (Riggio, 2003).Corporate Social Responsibility is a natural lesson in the life and every employee even executives and managers should be effected from this issue. according to survey about 100 million workdays are being affected due to Corporate Social Responsibility problem among employees and nearly 50% - 75% due to disease cause Corporate Social Responsibility (Bashir).

Absence and loss of employment are major cause of job Corporate Social Responsibility In the organization, the ratio increases day after day because of organisation environment. They were the main hurdles of achieving goals and performance (Treven 2002).

Employers need to be aware of how the population (organization) is changing with respect to age. For Example, the new trends in the banking industry show an inclination towards more hiring of young and fresh business graduates. So in near future, most jobs, even top-level executives would be young people. This also poses another issue that young individuals are more aggressive and sensitive so they are more likely to fall prey to Job Corporate Social

Responsibility (Qianqian Du, et al. (2009). Joanna. L.Y. Ho, et al. (2004) investigates the relationship between compensation benefit of employees on the basis of performance. Compensation relates with performance of employee in the organization accordingly show high performance as well as low performance of the employee.

Income has a major impact on the living standard of an individual. In reality, if this is said that it is the decider of the life-style of any individual, it would not be wrong. Income has also relationship with family life cycle which actually moulds the spending pattern of a family. Different researches have shown that the person with high income is having a different style of spending than low income groups' persons. If a person has a family to support and the number of households is large, then his only criteria of selection of a job would be the money which he would receive. So, any such individual who is being paid less whereas, his expenditure is more, he would eventually experience Job Corporate Social Responsibility. Kiridaran Kanagaretnam, et al (2001).

**Tool of Data Collection and Research Question**

The questionnaire wa distributed to the banking employees. Direct testing was surveyed primarily by administrating the questionnaire on around 110 numbers of respondents. The particular information was composed from the banking employees at all three levels in Banking sector. Interviews were conducted with the employees for assembly the various in sequences on their preparedness about their Bank (association) and the troubles which they face both directly and indirectly in the release of their everyday jobs. The respondents were interview on the issues touching the Corporate Social Responsibility levels of the workers, bang of relations pressures on their employment, expectations from their responsibility, up to what level they are happy and likely suggestions for overcoming the adversities of Corporate Social Responsibility by evaluating the individual initiatives and managerial initiatives.

**Analysis of Data**

The data will be analyzed to determine any differences between the Corporate Social Responsibility levels of employees and their impact on reducing Corporate Social Responsibility. So, the researchers attempted to analyze the demographic profiles such as gender, age, sex, marital status, qualification, family size, occupational status, monthly income, association with Banking Industry, number of New Account opening and sectioning of Loans are taken for the mode of the selected customers. For the purpose of analysis, 110 employees were taken into consideration.

**Results and Discussions**

- This paper also includes an analysis of data collected by representing it in tabular form along with interpretations.
- The information collected were analyzed for arriving at proper conclusion on the topic.

**CRM Strategy**

In order to understand how the employees know about CRM strategy of Bank employees Garret ranking technique was employed and the results are given in the Table 1

**Garrett Ranking Technique**

The above table 1 shows details about how the employees came to know about CRM strategy of Banking Industry in Madurai District. It is inferred that orientation given by officials ranked first which represents a mean score of 58.86, through training ranked second which represent a mean score of 57.73 ,through journals and magazines ranked third which represent a mean score of 48.5 ,through colleagues ranked fourth which represents a mean score of 45.95 and personal experience ranked fifth which represent a mean score of 38.95.

**Category of Customers Approaching**

The most important category of customers approaching the employees includes farmers, businessmen, professionals, government employees and private employees. The distribution of employees on the basis of category of customers approaching them is given in Table 2

**TABLE 2**

**Category of Customers Approaching**

| *Sl. No.* | *Category* | *No. of Employees* | *Percentage to Total* |
|---|---|---|---|
| 1. | Farmers | 19 | 17.27 |
| 2. | Businessmen | 35 | 31.82 |
| 3. | Professionals | 40 | 36.36 |
| 4. | Govt. Employees | 1 | 0.91 |
| 5. | Private Employees | 15 | 13.64 |
| | Total | 110 | 100.00 |

**Source: Primary Data**

The analysis infers that the most important category of customers approaching the employees is professionals and businessmen which constitute 36.36 per cent and 31.82 per cent of the total respectively.

**TABLE 3 at which stage the customers are approaching**

The most important stages at which the customers are approaching the employees is classified to at the time of opening account and making Deposit The distribution of employees on the basis of the stages at which the customers are approaching is given in Table 3.

**TABLE 3**

**At which stage the customers are approaching**

| *Sl. No* | *Particulars* | *No. of Employees* | *Percentage to Total* |
|---|---|---|---|
| 1. | At the time of opening New Account and Long term Deposit | 37 | 33.64 |
| 2. | At the time of New Account and Long term Deposit | 2 | 1.82 |
| 3. | At the time of closing the Deposit and settlement | 7 | 6.36 |
| 4. | At the time of closing the Deposit in middle | 1 | 0.91 |
| 5. | At the time of getting loan | 30 | 27.27 |
| 6. | At the time of transfer of Money in Account | 2 | 1.82 |
| 7. | At the time of loan repayment | 31 | 28.18 |
| | Total | 110 | 100.00 |

**Source: Primary Data**

It is revealed from Table 3 that the most important stage at which the customers are approaching the employees are at the time of At the time of opening New Account and Long term Deposit is 33.64 per cent, At the time of loan repayment 28.18 per cent and At the time of getting loan 27.27 per cent to the total respectively.

**TABLE 4 Satisfaction with the customer services provided by Banking Industry**

The satisfaction with the customer services provided by the Banking Industry may also determine the perception level of employees towards CRM in Banking Sector. The distribution of employees on the basis of satisfaction with the customer services provided by Banking is given in Table 4

**Table 4**

**Satisfaction with customer services provided by Banking Industry**

| *Sl. No.* | *Particulars* | *No. of Employees* | *Percentage to Total* |
|---|---|---|---|
| 1. | Yes | 84 | 76.36 |
| 2. | No | 26 | 23.64 |
| | Total | 110 | 100.00 |

The Table 4 shows that 76.36 per cent of the employees are satisfied with the customer service provided by the banks while the remaining 23.64 per cent of the employees are not at all satisfied with the service provided by the Banking Industry.

**TABLE 5 How you are Satisfied with the Services Provided by Banking Industry**

The most important reasons how the employees are satisfied with the services provided by Banks is classified to quick response, innovative service delivery, building relationship, good rapport and financial security. The distribution of employees on the basis of how they are satisfied with the services provided by Banks using Garret ranking technique is given in Table 5

**TABLE 5.**

**How you are Satisfied with the Services Provided by Banks in CSR**

| | *Rank* | *1* | *2* | *3* | *4* | *5* | *Total* | *Total* | *Average* | *Rank* |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Scale* | *75* | *60* | *50* | *40* | *25* | | | | |
| 1. | Quick Response | 41 | 45 | 5 | 16 | 2 | 109 | 6715 | 61.61 | I |
| | f | 3075 | 2700 | 250 | 640 | 50 | | | | |
| 2. | Innovative Service Delivery | 3 | 3 | 68 | 31 | 4 | 109 | 5145 | 47.20 | III |
| | | 225 | 180 | 3400 | 1240 | 100 | | | | |
| 3 | Building Relationship | 60 | 14 | 1 | 30 | 4 | | 6690 | 61.38 | II |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| . | f | 4500 | 840 | 50 | 1200 | 100 | 109 | | | |
| 4. | Good Rapport | 3 | 25 | 14 | 30 | 37 | 109 | 4550 | 41.74 | IV |
| | f | 225 | 1500 | 700 | 1200 | 925 | | | | |
| 5. | Financial Security | 2 | 22 | 21 | 2 | 62 | 110 | 4150 | 38.07 | V |
| | f | 150 | 1320 | 1050 | 80 | 1550 | | | | |
| | Total | 110 | 110 | 110 | 110 | 110 | | | | |

**Source: computed**

Note: x = Scale value; f = Number of Employees; fx = Score

On the basis of the ranks assigned by the employees the impacting variables are analyzed through Garrett Ranking Techniques. It is evident from the above table 5 that the employees have been much satisfied through customer service provided by Banks in respect of the variables, quick response (61.61) mean scores followed by building relationship (61.38), innovative service delivery (47.20), good rapport (41.74) and financial security (38.07) in the order of priority. Hence it can be concluded that as bank is quick in responding to all its queries the employees are much satisfied with the service offered by Banking Industry

**TABLE 6 attended the meeting of Banks**

The distribution of employees on the basis of meeting attended by them is given in Table 6

**TABLE 6**

**Attended the meeting of Banks**

| *Sl. No.* | *Particulars* | *No. of Employees* | *Percentage to Total* |
|---|---|---|---|
| 1. | Yes | 92 | 83.64 |
| 2. | No | 18 | 16.36 |
| | Total | 110 | 100.00 |

**Source: Primary Data**

It is inferred from the table 6 that out of the total employees ,83.64 per cent said that they had attended the meeting conducted by Banks, while the rest 16.36 per cent said that they had not attended the meeting.

**Table 7 Opinion about CRM Strategy in Banking Industry and Age of the Employees**

*Ho: There is no significant difference among the age of the employees with regard to the opinion of CRM strategy.*

To test the above hypothesis one-way analysis of the variance is used.

**TABLE 7**

**ANOVA among age of the employees about the opinion of CRM Strategy in Banking Industry in Madurai District**

| *Age Group* | *Sum of Squares* | *d.f.* | *Mean Square* | *F* | *Statistical inference* |
|---|---|---|---|---|---|
| Between Group | 1.325 | 4 | 0.331 | 3.432 | 0.011p<.05 Significant |
| Within Group | 10.138 | 105 | 0.097 | | |
| Total | 11.464 | 109 | | | |

**Source: Computed Data**

The table 7 depicts that there is a significant difference among age with regard to the opinion of CRM strategy and hence Null Hypothesis (Ho) is rejected. Hence it is concluded that CRM strategy in Banking Industry have significant difference among age.

**Table 8 Opinion about CRM Strategy in Banking Industry and Occupational Status of the Employees**

*Ho: There is no significant difference among the Occupational Status of the employees and the opinion of CRM Strategy in Banking Industry.*

To test the above hypothesis one-way analysis of the variance is used

**TABLE 8**

**ANOVA among occupational status of employees about the opinion of CRM Strategy in Banking Industry in Madurai District**

| *Age Group* | *Sum of Squares* | *d.f.* | *Mean Square* | *F* | *Statistical inference* |
|---|---|---|---|---|---|
| Between Group | 6.275 | 4 | 1.569 | 2.548 | 0.044p<0.05 Significant |
| Within Group | 64.643 | 105 | 0.616 | | |
| Total | 70.918 | 109 | | | |

**Source: Computed Data**

The table 8 shows that there is a significant difference among the occupational status of the employees with regard to the opinion of Banking Industry strategy and hence Null Hypothesis (Ho) is rejected. Hence it is concluded that CRM strategy in Banks have significant difference among occupational status.

**Table 9 Opinion about CRM Strategy in Banking Industry and Category of Customers approaching Employees**

*Ho: There is no significant difference among the Category of Customers of the employees about the opinion of CRM Strategy in Banking Industry*.

To test the above hypothesis one-way analysis of the variance is used

**TABLE 9**

**ANOVA among the category of customers approaching employees about the opinion of CRM Strategy in Banking Industry in Madurai District**

| *Age Group* | *Sum of Squares* | *d.f.* | *Mean Square* | *F* | *Staistical inference* |
|---|---|---|---|---|---|
| Between Group | 4.462 | 4 | 1.116 | 1.763 | 0.142p>0.05 Not Significant |
| Within Group | 66.456 | 105 | 0.633 | | |
| Total | 70.918 | 109 | | | |

**Source: Computed Data**

It is inferred from the table 9 that there is no significant difference among the category of customers approaching the employees with regard to the opinion of CRM strategy and hence Null Hypothesis (Ho) is accepted. Hence it is concluded that CRM strategy in Banks does not have significant difference among category of customers.

**Table 10 Solve the problem of the Account holders**

The distribution of employees with regard to solving the problem of the Account holders is given in Table 10

**TABLE 10**

**Solve the problem of the Account holders**

| *Sl. No.* | *Particulars* | *No. of Employees* | *Percentage to Total* |
|---|---|---|---|
| 1. | Yes | 110 | 100.00 |
| 2. | No | -- | -- |
| | Total | 110 | 100.00 |

**Source: Primary Data**

The Table 10 clearly shows that out of the total employees all of them said that they would solve the problem of the Account holders.

**Findings of the Study**

- It is clearly shown how the employees are involved in Corporate Social Responsibility and their involvement in organizational works which in turns in CRM.
- To examine and understand how the employees know about CRM strategy in Bank.
- To analysis the most important category of customers approaching the employees
- To analysis the Satisfaction level of the customer services provided by Banking Industry and find out the Occupational Status of the Employees
- To find out and analysis the Opinion about the CRM System in an Integral Part of the Work in Banks
- To analysis and find out Corporate Social Responsibility level while Solving the problem of the Account holders and Clearing the Doubts of the Account holders regarding loan Details and other operations
- The respondent were overburdened with work load in their work place
- Work life imbalance is one of the major attribute which contribute to Corporate Social Responsibility for an employee.

- The researcher identified few initiatives for effectively handling Corporate Social Responsibility. Meditation was found to be the essential part of living to increase Corporate Social Responsibility

**Suggestions**

- By providing regular and adequate training to the employee can help in reducing the work place Corporate Social Responsibility. So, that they can able to manage the situation even if they have too much of work or shortage of employee.
- Working at night shifts may be Corporate Social Responsibility but the employee needs to have proper diet and sleep, so that they can increase Corporate Social Responsibility in the night shift works. Emergency situation in hospital is on increase, so employee needs to adopt some relaxation techniques in order to reduce the Corporate Social Responsibility.
- Watching a patient's death is on increase in hospitals, so the employee needs to be emotionally strong enough to have a controlled and relaxed mind in order to provide better treatment for other patients without any mistakes.
- It is recommended to the company to initiate a few changes at the work place such as timely targets, distributed workload, flexible work hours and periodic relaxation.
- By conducting frequent recreational programs like get together in Organization concerned, medical camps, parties or on the achievements of any particular department, cultural activities, sports pleasure trips etc.

**Conclusion**

The work Corporate Social Responsibility management is being implemented in MMHRC from the past years and is successful in enhancing the employee morale. This can be seen in the employee performance; the employee increase s absenteeism and is satisfied with his job. The techniques so implemented have proved to be positive in nature. The employees are surely benefited from work Corporate Social Responsibility management.

More the employee's morale less is the chance of leaving the organization, so this reduces chances of leaving the organization. Yes, the different techniques adopted boost up confidence of employee. The quality of performance is not considered for vertical up graduation. The different techniques used are innovative plans; they are not based on any set standards. The employees are satisfied with the remuneration what they are paid.

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