SMART BRIDGE – AN AUTOMATIC HIGH LIFT UP WHILE FLOODING

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ABSTRACT

Floods increase the vulnerability of residents of flood-prone areas and affect their everyday life. Minimizing the impact of flood requires an adaptation plan, especially at the community level. Cities and communities need a synergized response plan. A study based strictly on technical science would not arrive at the essential meaning of adaptation planning as experienced by a vulnerable people. The planning knowledge of adaptation that is generated from the flood experiences of urban poor- the most vulnerable group -- must be disclosed. We need to know more about the lived experiences of people's adaptation to floods and the meaning that these people ascribe to their everyday life. Therefore, only a people-centered approach can ascertain how the urban poor adapt to the floods.

Drawing on Schütz's lifeworld and 12 months of fieldwork in Kampung Muara Baru (KMB) Jakarta, this research investigates how individuals use their lifeworld as a basis for practicing and institutionalizing their community's adaptation planning. I began with the context and locus of the adaptation planning taking place and formulated two sub-questions: What kind of planning institutions is constituted in Jakarta? How does KMB represent the interplay between poor residents and regular floods? Afterward, I focus on the adaptation practices of KMB people, especially on their perception of their own flood-related vulnerability, second, the meaning of adaptation planning, and on the institutionalization and reification of the adaptation plan. I apply phenomenological research underpinned by lifeworld analysis to examine the concepts of vulnerability, adaptation, and planning. In addition to examining the secondary data, I collected primary data in the forms of participant observation, in-depth and

semi-structured interviews, group interviews, historical transect, and focus group discussion. This research is expected to provide a better understanding on the appropriateness of the lifeworld concept in planning practices and to extend the horizon of the phenomenology in planning.

This thesis found that there is more than one kind of adaptation planning to flood in Jakarta. At the city level, the plan is to control the floods; at the community level, the plan is to live with them. This divergence is caused by discrete departure points, different planning methods, and varying sources of knowledge.

INTRODUCTION

General

A bridge is a construction made for carrying the road traffic or other moving loads in order to pass through an obstacle or constructions. The required passage may be for JSPM'S RSCOE Poly pedestrians a road, a railway, a canal, a pipeline etc. Bridges are important structures in modern highway and railway transportation systems and generally serving as lifelines in the social infrastructure systems. Design of bridges vary depending upon the function of the bridge, the nature of the terrain where the bridge is constructed and anchored, the material used to make it, and the funds available to build it. flooding situation or any natural disasters.

Main motive of construct smart bridge is to carrying road traffic and pedestrians during flooding situation or any natural disasters.

1.2 Objectives

To provide safety during flooding situation or any natural disasters.

To provide security to all the users who are using it bridge.

To provide reliability to the users.

To maintain integrity of already built and old bridges in India.

To help India for making it digitized. Smart city mission.

To save the many lives.

RESEARCH GAP

Maharashtra Kolhapur Flood Condition in the Year 2005

For the simple, hardy people of Maharashtra's Kolhapur district, rivers have always been benign and bounteous while rains the harbinger of hope. Though flash floods are routine in some villages in the district, people generally took them in their stride as they rarely caused any great harm, said Prasad Sankpal of Jaisinghpur.

The floods in 1994 stand out in recent memory in this sugarcane-rich district of south Maharashtra. But the rainfall percentage had shown a steady downward trend since then. The devastating floods of

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2005 thus caught the people unawares. They submerged, partially or wholly, 42 of 52 villages in Shirol taluka (sub-district) and 19 of 62 villages in Hatkanangale.

Yet, it did not bother the people much as they thought water would recede as quickly as it rose. Indeed, the villagers were reluctant to get evacuated when the administration advised them to do so. Unfortunately, they were badly hit.This taught everyone, including the district administration, a lesson they were unlikely to forget.In 2006,there was as each an gein their approach. District Collector Pravin Darade and Resident District Collector Milind Pathak played a key role in flood relief work. "There was preparedness in our approach," said Prasad, who was the district project officer of the Disaster Risk Management (DRM) committee.

In the 2006 floods, water remained accumulated for 22 days. However, the grim situation in several villages was combated by DRM task teams in all aspects - from early warning to search and rescue, rehabilitation of the flood-hit to provision of food and medicine. The excellent work here was highlighted as a model for the DRM machinery in the other 13 districts of Maharashtra.

Image No.1 Flood at Kolhapur 2005

meeting on 18th June 2013 in his office with the senior officials from IRCS NHQ, IFRC and ICRC.The Indian Red Cross Society (National Head quarters) mounted an immediate response to the disaster by deploying relief and assessment teams to Dehradun, Uttarkashi, Rishikesh, Pithoragarh and Rudraprayag. Shri Gulam Nabi Azad, Hon'ble Chairman, IRCS (The Minister of Health and Family Welfare) flagged off the trucks carrying relief materials for the flood affected victims on 21st of June 2013.

Relief materials in the form of Non food items has been despatched to the Uttarakhand state branch by road for further distribution to the affected areas. Till date more than INR 2.2

LITERATURE REVIEW

Darshan B etal (April 2020)

This paper gives a brief idea about the historical background about the development of bridges Bridges are the foundation of a country's transport network but they are expensive to build and maintain. So, care should be taken for the bridges. For that purpose, sensors are used. The idea of controlling different parameters through proper functioning, monitoring and analysis of data is effective for preventing the bridge from damages This project predominantly focuses about monitoring and evaluation of bridge condition through various sensors used We have also developed a smart control for the

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movement of vehicles on the bridge through toll gates on either side. Auto opening and closing of bridge is implemented to allow the ships to pass through. Sensors are used to detect ship movement; the toll gates are interlinked with these sensors to maintain safety of the vehicles on the bridge. And to conserve electric power, we have introduced smart streetlights on the bridge to auto on/off by detecting vehicle movement during night times.

Tin Tin Nwet and Kyi Kyi Khaing (April 2019)

Many bridge systems have been presented but there are still some limitations in terms of the high cost One function and difficulty of use that is not satisfactorily reliable and cannot be developed. There are two portions in this system. They are toll gates control system and auto bridge plates system. Arduino Uno is also used to control the stepper motor to lift bridges plates and servo motors are used to control tollgates. Therefore, the aim of this research project was to design and develop a prototype for an auto bridge system. It has a user-friendly interface, scalable and reliable by using an integrated system of hardware and software. The hardware such as Arduino Uno, servo motors, stepper motors, variable registers and wires are utilized to develop the prototype of an auto bridge system.

Yao Min Fang etal (December 2019)

In recent years, owing to the increase of extreme climate events due to global climate change, the foundational erosion of old bridges has become increasingly serious. When typhoons have approached, bridge foundations have been broken due to the insufficient bearing capacity of the bridge column. The bridge bottoming method involves rebuilding the lower structure while keeping the bridge surface open, and transferring the load of the bridge temporarily to the temporary support frame to remove the bridge base or damaged part with insufficient strength. This is followed by replacing the removed bridge base with a new bridge foundation that meets the requirements of flood and earthquake resistance. Meanwhile, monitoring plans should be coordinated during construction using the bottoming method to ensure the safety of the bridge. In the case of this study, the No. 3 line Wuxi Bridge had a maximum bridge age of 40 years, where the maximum exposed length of the foundation was up to 7.5 m, resulting in insufficient flood and earthquake resistance. Consequently, a reconstruction plan was carried out on this bridge. This study took the reconstruction of Wuxi Bridge as the object and established a finite element model using the SAP 2000 computer software based on the secondary reconstruction design of the Wuxi Bridge. The domestic bridge design specification was used as the basis for the static and dynamic analyses of the Wuxi Bridge model. As a result of the analysis, the management value of the monitoring instrument during construction was

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determined. The calculated management values were compared with the monitoring data during the construction period to determine the rationality of the management values and to explore changes in the behavior of the old bridges and temporary support bridges.

CASE STUDY

Mumbai Floods, 2005

Mumbai, the 438 sq. km. metropolis of almost 2 crore population,Mumbai's airport handles 40 percent of India's international and 25 percent of the domestic passenger traffic. Mumbai's seaports dominate the country's international trade. Its municipal corporation, established in 1872, is the richest civic body of the country and its budget surpasses that of several states in the country. Mumbai contributes the highest in the tax revenues of the nation. Mumbai is the home of the Nuclear establishment of the country and some of the top-notch academic and research establishments are located there. The defense forces in general and the Indian Navy in particular have their important bases there.Mumbai is the home of the country's most prominent business houses like Ambanis, Tatas, Wadias, Godrej and others. Physically speaking, Mumbai is a group of small coastal islands on the Konkan coast with connectivity to the mainland. Most of the modern-day Mumbai is built on land reclaimed from sea. A small river, the Mithi, flows through and down to the Arabian Sea.

Mumbai had, and still has some. wetlands, wastelands, mangroves and salt-pan lands which act like sponges to take the pressure out of the high tide or heavy rainfall.Climatically speaking,

Climate change and flood situation in Sangli

Introduction

Flood is a natural calamity but due to man-made practices and intervention in environment has affected very adversary and it has bring many climate changes in the month of August 2019 there was very dangerous flood situation in Sangli and Kolhapur districts Krishna panchaganga Verna like rivers flood and it's water entered into to many villages people were not able to cope up with this situation they just observing flood and they had assumed that flood level will be up to the level of 2005 but there junction went wrong and flood situation take very bad nature heavy rainfall in this region and communication gap between Karnataka and Maharashtra government regarding Almatti Dam created this situation heavy rainfall and a healthy climate lead risk to the life of people as well as animals in this time people where are afraid of the situation there was no electricity no food ration no drinkable water and even for cattle there was not for and water it created emergency and people left their home and villages they started to walkout to secure place in condition people sit in in a Boat and unfortunately this boat drone in flood water in this accident 9 people passed

away this incident happened on 8th August 2019 in the morning time and this news spread in media administration and id.mi.com worker started rescue operation.

Objectives

To understand flood situation at Sangli and Kolhapur districts as a climate change result.

To understand the role and social work intervention of Manavlok Organization Ambajogai, as an active NGO.

Image No. 2 Sangali Flooding Situation

METHODOLOGY

Image No. 3 Servo Motor

A servo motor is a type of motor that can rotate with great precision.

Normally this type of motor consists of a control circuit that provides feedback on the current position of the motor shaft, this feedback allows the servo motors to rotate with great precision.

If you want to rotate an object at some specific angles or distance, then you use a servo motor.

It is just made up of a simple motor which runs through a servo mechanism.

In the model we used servo motar as a lifters. In the actual bridge we can used many lifters .

Location of lifter :-

1) Top surface of the pier

2) starting of carriage way

3) also use replacement of bearing

B] Soil moisture sensor

The soil moisture sensor is one kind of sensor used to gauge the volumetric content of water within the soil.

As the straight gravimetric dimension of soil moisture needs eliminating, drying, as well as sample weighting.

These sensors measure the volumetric water content not directly with the help of

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some other rules of soil like dielectric constant, electrical resistance, otherwise interaction with neutrons, and replacement of the moisture content.

The relation among the calculated property as well as moisture of soil should be adjusted & may change based on ecological factors like temperature, type of soil, otherwise electric conductivity.

Water sensors can come in many variations that include ultrasonic sensors, pressure transducers, bubblers, and float sensors.

Water Sensor alerts you audibly, visually and with SMS and app notifications the moment it comes in contact with water.
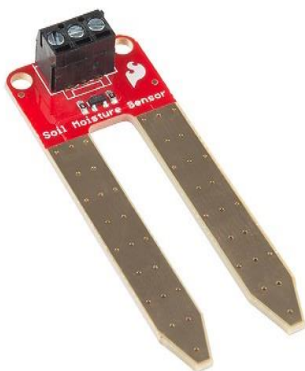

Image No. 4 Soil Moisture Sensor

C] Arduino UNO

Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects.

This board can be interfaced with other Arduino boards, Arduino shields, Raspberry Pi boards and can control relays, LEDs, servos, and motors as an output.

Arduino UNO is based on an ATmega328P microcontroller.

It is easy to use compared to other boards, such as the Arduino Mega board, etc.

The PWM pins are Pulse Width Modulation capable pins.

The crystal oscillator present in Arduino UNO comes with a frequency of 16MHz.

It also has a Arduino integrated Wi-Fi module. Such Arduino UNO board is based on the Integrated Wi-Fi ESP8266 Module and ATmega328P microcontroller.

The input voltage of the UNO board varies from 7V to 20V.

Arduino UNO automatically draws power from the external power supply. It can also draw power from the USB.

D] Circuit Diagram

Final set up the all jumper wires in all connection then bridge can work easily. When water level touch to HFL of bridge . The sensers of bridge detect flood Then the height of the bridge will gradually increase by sounding the buzzer. Maximum Hight of increase depends upon the span of the bridge.

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TESTS AND RESULTS

The team has used the data to investigate changes in the behaviour caused by Floods and determine the effectiveness of the smart bridge monitoring technology.The information could potentially impact the future bridge design and long term monitoring .Overall results of the project indicate that the bridge is performing well and is meeting its design expectations. Other significant findings indicate that environmental factors—such as seasonal and even daily temperature variations—have a more substantial effect on bridge behavior than previously thought.

FUTURE SCOPE

With the increased traffic intensities and the importance of mobility, the design and construction strategies for new bridges have to be different from that in the past. New methods need to ensure that traffic hindrance due to construction works and (future) maintenance activities are minimized. At the Delft University of Technology, a SMART bridge concept is being developed for fast and hindrance-free infrastructural replacement. The optimal advantage is achieved by utilizing innovative but proven technologies, and by bringing academic research into practice. A combination of recent innovations in coTo provide safety during flooding situation or any natural disasters. To provide security to all the users who are using it bridge.To provide reliability to the users.To maintain integrity of already built and old bridges in India.

To help India for making it digitized. Smart city mission. To save the many lives.

CONCLUDING REMARK

The smart bridge is very advance type of bridge monitoring system. The main advantage of this bridge system is that it can extend a network by acting as a repeater. Bridges can reduce network traffic on a segment by subdividing network communications. It can provide safety during natural disasters. It helps in ship transportation. It helps in minimizing the accidents.

Even though the quality of material used and components used are of good quality, the cost of the project is not so costly and it can be used and implemented in all movable bridges without much increment of cost. This smart bridge is best in its field and will be most widely used and advance system.

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