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ROAD SIDE DRAINAGE MONITORING SYSTEM

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Abstract— The drainage system is the action of draining waste water and sticky liquid components towards the rivers using particular patterns, drainage channels and streams. Drainage system basically refers to all the piping within the private and public premises which conveys sewage, rainwater and other liquid waste to a point of disposal. The connected devices will make the drainage system more comfortable to operate, monitor, control with less resources and to take necessary actions. Most of the cities adopted the underground drainage system and it is the duty of Municipal Corporation to maintain cleanliness, healthy and safety of cities. If the drainage system is not properly managed then pure water gets contaminate with drainage water and infectious diseases may get spread. The drainage gets blocked during rainy season and it will create the problems to routine life like traffic may get jammed, environment will become dirty and totally it will upsets the public. So our main focus is to monitor the manholes using sensors. If drainage gets blocked or water overflows, the sensor senses the activity and sends the information via transmitter to the concern persons.

I. INTRODUCTION

This electronic document road is indispensible ingradiant development in any society. Inbuilt up areas network of road are constructed to support human and vehicular traffic. In compliment drainage facility are provided to ensure timely disposal of sewage and surface water runoff generated from expansive impermeable surface. The function of drainage system is to control the water table, whereas the function of the main drainage system is to collect , transport and dispose of water through an outlet. Improper drainage system causes blockage due to sluggish water flow and surface runoff in rainy season. This consequently lead to unfriendly living environment.

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We observe such problem in some areas in Ahmednagar .we studied causes topographical conditions ,drainage system. We found that after making proper drainage system,implementation of sensors, we can detect blockage and solve problem arising due to surface runoff .

There are several concerns about the sustainability of irrigation and drainage projects, and there are water quality problems related to the disposal of drainage water. There are also problems with land degradation due to irrigation induced salinity and waterlogging. There have been instances where saline or high nutrient drainage water has damaged aquatic ecosystems.

Drainage continues to be a vital and necessary component of agricultural production systems. In order to enhance the net benefits of drainage systems, more attention will need to be given to the water quality impacts of drainage water disposal. This document identifies potential problems and management options in the development, production, treatment and disposal of agricultural drainage water.

II. NEED FOR DRAINAGE MONITORING SYSTEM

Excess water in the crop root zone soil is injurious to plant growth. Crop yields are drastically reduced on poorly drained soils, and, in cases of prolonged waterlogging, plants eventually die due to a lack of oxygen in the root zone. Sources of excess soil water that result in high water tables include: high precipitation in humid regions; surplus irrigation water and canal seepage in the irrigated lands; and artesian pressure. Waterlogging in irrigated regions may result in excess soil salinity, i.e., the accumulation of salts in the plant root zone. Artificial drainage is essential on poorly drained agricultural fields to provide optimum air and salt environments in the root zone. Drainage is regarded as an important water management practice, and as a component of efficient crop production systems. World food supply and the productivity of existing agricultural lands can only be maintained and enhanced if drainage improvements are undertaken on cropland currently affected by excess water and high water tables.

III. LITERATURE REVIEW

A. Owuama C. O., Uja E., and Kingsley C. O. (April 2014). "Sustainable Drainage System for Road Networking." 12, 271-289-In built up flat areas flood control is often achallenge. Drainage systems involving open concrete or pipedrains on roads pose significant problems arising fromblockade due to anthropogenic factors and sluggish water flowdue to very low invert grade. These consequently lead tounfriendly living environment. The sustainability of suchdrains for effective performance is grossly in doubt. Analternative and sustainable drainage system is a trenchlessdrain comprising absorption unit and grass cover. Thetechnology provides a cheap, aesthetic and effective method ofdisposing road surface runoff with minimal distress to usersand minimal damage to the environment.

Urban roads are often designed with camber towards open concrete drains on both sides of the road. In some cases large diameter pipe drains are used to convey storm water. Culverts are provided at crossings over open concrete drains.

B. Jimma University Institute of Technology, Civil engineering department, Jimma, Ethiopia (2015). "Assessment of the Effect of Urban Road Surface Drainage: A Case Study at GinjoGuduruKebele of Jimma Town" 28, 293-300- Drainage is one of the most important factors to be considered in the road design, construction and

maintenance projects. It is generally accepted that road structures work well and last longer to give the desired service. When a road fails, whether it is concrete, asphalt or gravel, inadequate drainage is often a major factor to be considered. Researchers have shown that poor drainage is often the main cause of road damages and problems with long term road serviceability. Though provision of proper road surface drainage systems have such a great importance for the urban road to give the intended use and thereby contribute to the overall development of a nation, in particular in road sector, the practice of the construction of proper integrated drainage structures did not get due attention in our country in general and Jimma town in particular for many years.

Therefore the problems and achievements on the design, construction and maintenance of surface road drainage systems need to be assessed to provide remedial measures for the better performance of the road infrastructure. The objective of this study was to assess road surface water drainage problems and its net-work integration systems in GinjoGuduruKebele of Jimma town. A cross-sectional study was conducted in GinjoGuduruKebele of Jimma town from January to August 2014.The data collected was then be analyzed quantitatively and qualitatively, and the result of the study thus presented in tables and in themes. From the study made, generally it was observed that the road surface drainage found to be inadequate due insufficient road profile, insufficient drainage structures provision, improper maintenance and lack of proper interconnections between the road and drainage infrastructures thereby resulting damages to road surface material and flooding in the area.

C. Anshu Adwani, Kirti H. Madan, Rohit Hande (July 2015) "Smart Highways Systems for Future Cities" 41, 208-223- An intelligent Highway is an innovative concept for smart roads of future smart cities. It is a program of innovation that links a different way of looking at things with innovative ideas that apply the opportunities offered by new technologies in smart ways. Nowadays safety on road has become an important factor in our life because there is an increasing amount of accidents on the road and there are some places where accident occur frequently such as crossings, turns. Also there is a big problem of traffic jams on the road. Due to heavy rain fall, there is a possibility of water overflow on the bridges and accident may occur. In hilly area there is a possibility of landslide. so, there came a need to design a system which can detect these unexpected events. So we are designing a system that is "An Intelligent Highway system with (Weather Accidents Landslides and traffic) W.A.L.T." which is an innovative concept to maintain safety on roads. The system will make use of digital sensor to acquire data of landslide, accidents traffic jams and weather condition and that will be displayed on active LED display on road, using XBee and GSM technologies.

D. A. J. Hoevenaars, P. P. Mollinga, W. Scheumann, R. Slootweg, and F. VandSteengergen. (2005) "Tile Drainage Literature Review" 19:71-87C_springes 2005- Drainage needs to reclaim its rightful position as an indispensable element in the integrated management of land and water. An integrated approach to drainage can be developed by means of systematic mapping of the functions of natural resources systems (goods and services) and the values attributed to these functions by people. This mapping allows the exploration of the implications of particular drainage interventions. In that sense an analytical tool for understanding a drainage situation is proposed. The process dimension of the functions and values evaluation and assessment is participatory planning, modeled on co-management approaches to natural resources management. This provides a framework for discussion and negotiation of trade-offs related to the different functions and values related to drainage. In that sense the approach is a communication, planning and decision-making tool. The tool is called DRAINFRAME, which stands for Drainage Integrated Analytical Framework. The implementation of an integrated approach posits challenges for the governance, management and finance of drainage, as well as for research and design of drainage infrastructure and operation. Both have to be rethought from the perspective of multi-functionality.

IV. BLOCK DIAGRAM OF SENSOR

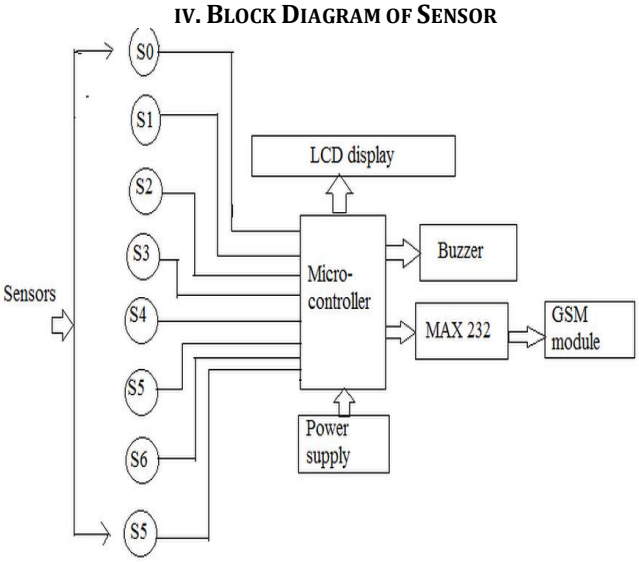

Fig.No.1Block Diagram

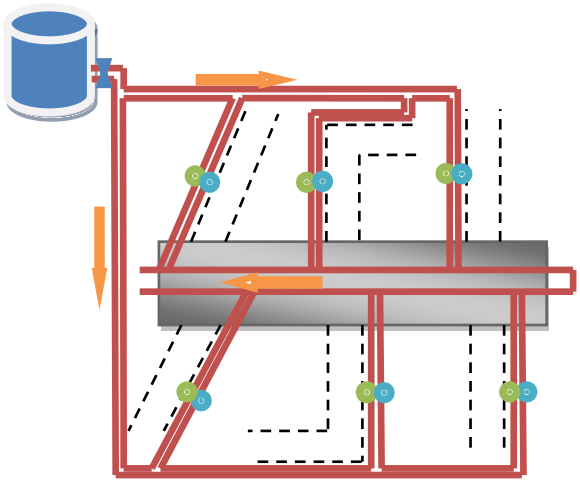

Fig. No. 2 Implementation drainage diagram

V. DESIGN OF SENSOR

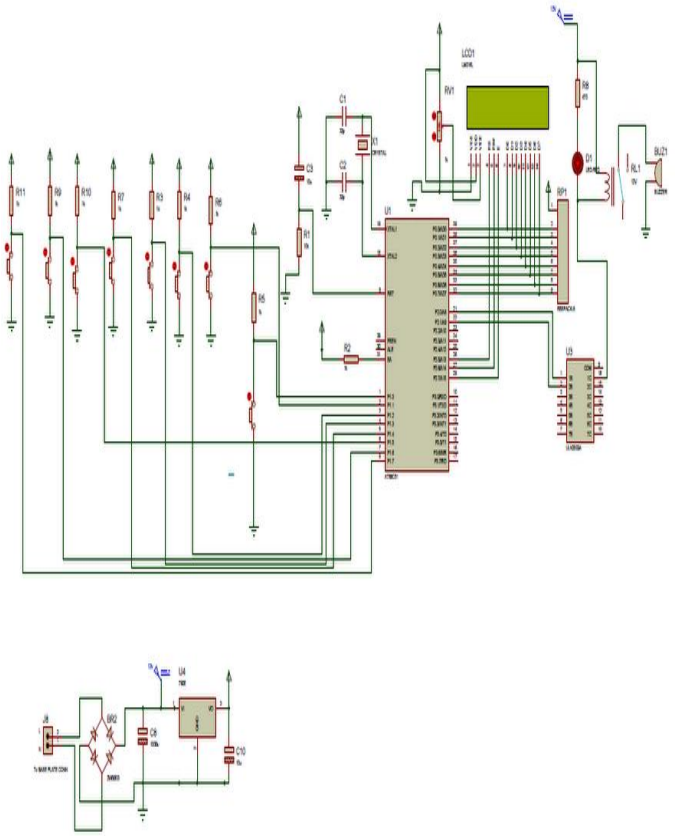

Fig. No. 3

A microcontroller is a small computer on a single IC that integrates all the features that are found in the microprocessor. In order to serve different applications, it has a high concentration of on chip facilities such as RAM, ROM, I/O ports, timers, serial port, clock circuit and interrupts. Microcontrollers are used in various automatically controlled devices such as remote controls, automobile engine control systems, medical devices, power tools, office machines, toys, and other embedded system.

A. Pin Diagram of 8051 Microcontroller

8051 microcontroller families (89C51, 8751, DS89C4xO, 89C52) come in different packages like quad-flat package, leadless chip carrier and dual-in-line package. These all packages consist of 40 pins which are dedicated to several functions such as I/O, address, RD, WR, data and interrupts. But, some companies offer a 20-pin version of the microcontrollers for less demanding applications by reducing the number of I/O ports. Nevertheless, a vast majority of developers use the 40-pin chip. The pin diagram of 8051 microcontroller consists of 40 pins as shown below. A total of 32 pins are set away into four Ports such as P0, P1, P2 and P3. Where, each port contains 8 pins.

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