Abstract—Sand is an essential need for all kind of construction work. Due to increase in population, large amount of construction is being done. Usually sand is taken from sand mill. The excess amount of sand has been taken from the sand mill without permission which is called “Sand theft”. Due to this, the environment is affected. There is no other prevention method available other then security officers. So we propose a system to monitor the amount of sand extraction by RFID reader which installed in the check post and RFID tag which is installed in the vehicle. The RFID tag should be mandatory in the vehicle. Sand mill is monitored by laser diode. The vehicle will be identified by its ID whether it is authorized or not. GSM module is used to send message to the higher official and media members if illegal amount of sand mining occurs by unauthorized vehicle or excess amount of sand is taken by authorized vehicle.

Keywords—RFID reader and tag, Laser diode, IR sensor, GSM module.

1. INTRODUCTION
Excess amount of sand is taken from the quarry illegally so many natural disaster occurs. It took so many years to produce sand. The sand theft causes many problems to the future generation. We provide a system to monitor the sand theft occurred in the sand mill by a module consist of RFID reader and tag, IR sensor, GSM module, laser diode. In our project RFID reader is used to read the vehicle details, IR sensor detects the vehicle with load or not, the laser diode is used to monitor the sand mill. The GSM module is used to generate message.

2. PROPOSED SYSTEM
In the proposed system we monitor sand mining occurred daily by transportation, to overcome this problem. We fix RFID reader in the check post. It is used to sense RFID tag fixed in the vehicle. The reading distance of the RFID tag is merely 8-12 cm that is used to identify the unauthorized vehicle.

The vehicle consists of two types :
- Authorized vehicle which is permitted by the government
- Unauthorized vehicle which has no permit.

The RFID reader is used to check whether the vehicle is authorized or not at the same time RFID is used to perform counting of authorized lorry transportation with sand. IR sensor is used to detect the vehicle contains a load or not. The message is sent to higher officials, media persons by using GSM technology. Laser diode is used to monitor the sand mill whether the vehicle is entering in the incorrect way.

3. ARDUINO UNO
The Arduino Uno is a low power 8-bit AVR microcontroller board based on the ATmega328 with flash memory. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16MHZ ceramic resonator, a USB connection, a power jack, an In-Circuit Serial Programming(ICSP) header, and a reset button. It contains all the features needed to support the microcontroller. By simply plugging it to a computer with USB cable or power it with AC to DC adapter or battery to start working.
4. RFID READER MODULE

This is a low frequency (125khz) RFID reader with serial output with a range of 8-12cm. It is a compact unit with built-in antenna and can be directly connected to PC using RS232 protocol.

A. RFID – RADIO FREQUENCY IDENTIFICATION

The conventional method of tracking an object, monitoring maintenance of database involves recording the necessary details manually. This manual method has the following disadvantages:

- Prone to error
- Highly time consuming
- Tedious
- Unreliable
- Manipulation of entries is possible

An advanced automatic identification system known as RADIO FREQUENCY IDENTIFICATION technology (RFID) is a remedial measure which would eliminate the problems of the conventional system. RFID consists of electrical device called RFID tags which stores the unique information about the person and transmits this information continuously. The transceivers at different locations pick up the necessary information from the tag.

B. RFID TECHNOLOGY- AN OVERVIEW

RFID stands for radio frequency identification. It is an automatic identification technology to identify objects by using invisible radio waves. Instead of optically scanning bar codes on a label, RFID uses radio waves to capture data from tags. One of the key characteristics of RFID is that it does not require the tag to be seen to read the data stored in it. This means that the tag can be placed either inside or outside. To accomplish this, 2 components are essential: reader and a tag.

C. BASIC ELEMENTS OF RFID

1. Tag
2. Readers

TAG

A tag, also called as transponder, is made of a micro-chip with a coiled antenna. The tag can be programmed with unique information about the object and hence can be used to identify it. RFID tags can be encased in hardened plastic coatings making them extremely durable. RFID tags can store large amounts of data. High end RFID tags can store up to 1 megabyte of data. Some RFID tags supports read/write operations, enabling real-time information updates as the tagged item moves from one location to another.

D. TYPES OF RFID TAGS

1. PASSIVE
2. ACTIVE

PASSIVE

Passive RFID tags have no internal power supply. The minute electrical current induced in the antenna by the incoming radio frequency signal provides just enough power for the CMOS integrated circuit in the tag to power up and transmit a response. Most passive tags signal by backscattering the carrier signal from the reader. This means that the antenna has to be designed to both collect power from the incoming signal and also to transmit the outbound backscatter signal. The response of a passive RFID tag is not necessarily just an ID number; the tag chip can contain non-volatile EEPROM for storing data.

5. IR SENSOR

GP2Y0A02YK0F is a distance measuring sensor unit, composed of an integrated combination of PSD (position sensitive detector) , IRED (infrared emitting diode) and signal processing circuit.

The variety of the reflectivity of the object, the environmental temperature and the operating duration are not influenced easily to the distance detection because of adopting the triangulation method.

This device outputs the voltage corresponding to the detection distance. So this sensor can also be used as proximity sensor.
6. LASER DIODE

A laser diode, or LD, is an electrically pumped semiconductor laser in which the active laser medium is formed by a p-n junction of a semiconductor diode similar to that found in a Light-emitting diode. The laser diode is the most common type of laser produced with a wide range of uses that include fiber optic communications, barcode readers, laser pointers, CD/DVD/Blu-ray Disc reading and recording, laser printing, laser scanning and increasingly directional lighting sources.

7. PHOTORESISTOR

A photoresistor (or light-dependent resistor, LDR, or photocell) is a light-controlled variable resistor. The resistance of a photoresistor decreases with increasing incident light intensity; in other words, it exhibits photoconductivity. A photoresistor can be applied in light sensitive detector circuits, and light and dark activated switching circuits. A photoresistor is made of a high resistance semiconductor. In the dark, a photoresistor can have a resistance as high as several meg ohms (MΩ), while in the light, a photoresistor can have a resistance as low as a few hundred ohms.

8. DUAL BAND GSM MODEM

The GSM Modem can accept any GSM network operator SIM card and act just like a mobile phone with its own ideal number. It requires the SIM card and a connectivity to the GSM network. It can also be used in GPRS mode to connect to the internet and use all the applications for the data logging. It is a wireless MODEM and can send and receive data through the GSM network.

9. CONCLUSION

Finally we conclude that sand theft is being monitor and avoided by this project and sand gets for fertile. Natural calamities can be minimized so sand gets strength. The future generation can be saved.

10. FUTURE WORK

Sand theft which occur can be uploaded in a specific website where public can know problem occur in the sand mill. The sand depth can also be calculated by the sensor generated by the VLSI design. The sand mining can be monitor by the government directly by using satellite communication.

REFERENCE