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***Abstract*—Abstract-The following paper focuses over the project which is cohesively based on "Smart Irrigation System" ; generally speaking it explains the fusion of modern and advanced "IOT"(Internet of things) technologies with the traditionally existing agricultural practices of Irrigation .**

***Index Terms*—Embedded, IOT, ESP, GDP**

## I. INTRODUCTION

The Currently existing agricultural practices of irrigation are mainly dependent upon the check basin method , furrow irrigation method , strip irrigation method , basin irrigation method and generally employ traditional diesel engines and pump sets connected to the bore well and from last few years ,the use of summer sever has also been started and its efficiency is more in comparison to the traditional practices of irrigation being practiced . And the following paper focuses over the fusion of traditional irrigation practices along with the existing IOT technologies such as use of photoelectronic sensors for Day/Night sensing and moisture sensor for sensing the moisture level in the soil and ph level sensor can also be employed to detect the ph level of the soil .

## II. AGRICULTURE IN INDIA

The history of agriculture in India dates back to the Indus Valley Culture. India ranks second worldwide in farm outputs. As per 2018, agriculture employed more than 50% of the Indian work force and contributed 17–18% to country's GDP. Indian irrigation infrastructure mainly comprises of a net-work of major and minor canals from rivers, groundwater well- based systems, tanks, and other rain water harvesting projects for agricultural activities Of these, the groundwater system is the largest which is pumped on to the ground using Summer Sever pump.

Electric submersible pump in short (ESP) is a device which has a air tight motor close-coupled to the pump body. The whole assembly is submerged in the fluid which needs to be pumped. The main advantage of this type of pump is that it prevents pump capitation a problem associated with a high elevation difference between the pump and the fluid surface. Submersible pumps push fluid to the surface, rather than jet pumps, which create a vacuum and rely upon atmospheric pressure. Submersibles use pressurized fluid from the surface to drive a hydraulic motor down hole, rather than an electric motor, and are used in heavy oil applications with heatedwater as the motive fluid.

## III. GAPS FROM THE LITERATURE

If we talk about the inefficiency or the root cause of the less production rate or benefit ,then the reason might be directly subjected to the less efficient agricultural systems and inadequate knowledge in the specified field.

Furthermore elaborating the loop holes in the agriculture sector , its clearly visible the higher and increasing rate of the technical equipments is also the main factor affecting the production rate.

## IV. BASE DESIGN IMPLEMENTATION

- The Basic Idea is to combine the concepts of IOT and High-end electrically Efficient systems to create Smart Agricultural Systems.
- And also in order to increase the overall efficiency of the present agricultural condition and technical availability in the Market and also its reach to the general farming strata of the country.
- The general and traditional irrigation practices of our country includes use of the diesel engine pumps , tube wells .

## V. REGULATIONS & DESIGN CONSTARINTS

The regulations & design constraints in the project might arise due to the location constraints and the availability of the resources in surrounding to implement the project.

Design constraints & regulations might include the size of bore well or the size of the pipe to extrude the water from the ground or the power and specifications of the summer sever motor & pump set to pull out the water from the ground .

## VI. ECONOMIC , ENVIROMENTAL , HEALTH, MANUFACTURIBLITY & SAFETY CONSTRAINTS IN THE DESIGN

As already discussed the primary source of food and income in India is agriculture sector only which contributed 20.19% of the total GDP in the year 2021.

Agriculture being the environment friendly sector produces less carbon emission and low pollution as compared to the other sectors in the country hence less health related issues is guaranteed ; and if we talk about the manufacturability and safety constraints then following the necessary government certified industry guidelines then these constraints can be resolved as well.

## VII. PROFESSIONAL AND ETHICAL CONSTRAINTS

Professionally talking the real time implementation of

the project to the field requires expertise in the electrical and its related subsequent areas such as IOT , Embedded and a bit

of programming in order to program the microcontroller to control the entire smart irrigation system.

Ethically talking anything done with good and humane intention and gesture and which can be used for humanely purposes for making the tasks easily accomplished is considered Ethically Affirmative in its very consideration .

## VIII. SOCIAL AND POLITICAL CONTRAINTS

Socially talking the Agriculture sector being the primary food provider procures the food demand of the entire population of the country ; Hence it is socially acceptable practice.

Politically talking agriculture become the main ideology and base on which political parties form their policies and talk about the benefits and betterment of agricultural sector for their political interests; hence agricultural gain would also lead to the political gain as well.

## IX. SOCIAL AND POLITICAL CONSTRAINTS

Features and characteristic and of the solution includes the upgradation and replacement of the currently existing traditional practices and features with the new IOT enabled electrical and electronic equipment in the agricultural field for the better productivity and GDP growth in the agricultural sector.

## X. MULTIPLE DESIGN ALTERNATES/DESIGN SOLUTIONS

Apart from the multiple design and pump systems present in the market for irrigation and farming purposes ,the system with maximum output efficiency of water and farming output must be considered the ideal system design for the implementation to the ground level

## XI. DETAILED SYSREM DESIGN

The system design includes a microcontroller (Arduino Uno in this case), a servo motor for the switching purpose; connected to the external power supply of 12V using an adapter for balancing the power requirement on the UNO board as power from the USB cord is not enough for running the servo motor . the servo motor along with the a mechanism acts as the switching elements between the solar panel and the pump.

## XII. CHNICAL DETAILS

Microcontroller Arduino Uno (Atmega 328p) has also been used for controlling the Servo Motor which again in result is being used for controlling the Pump by the consequences of reading the sensor value either its data for day or night or the soil data or the ph value data.

## XIII. CONCLUSION

The main objective of the project is to implement modern technical efficiency and systems to the current agricultural trend.

The other objective is to increase the current performance and efficiency of the market and agricultural strata of the country

And at last the main objective is to increase the overall economic GDP of the current Indian agricultural market .

## XIV. REFRENENCES

[1]https://www.researchgate.net/publication/267030052_Modern_trends_in_the_development_of_agriculture_and_demands_on_plant_breeding_and_soil_management