Tech Tonics

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THAKUR TRUSTS

THAKUR INSTITUTE OF
MANAGEMENT STUDIES, CAREER
DEVELOPMENT & RESEARCH

AIM
The research and development is transforming the computing paradigms and technology in multidimensional directions. Tech Tonics aims to inculcate research culture among post graduate students and make them aware of new innovations happenings in the field of information technology.

TECH TONICS
TIMSCDR Research Journal

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Academic Year: 2017-2018

Vision

Thakur Institute of Management Studies, Career Development and Research will become a premier Institute renowned internationally for providing education in Software Application to graduates from various disciplines.

Mission

To achieve excellence in providing software education so that students can grasp existing as well as emerging technologies and to inculcate leadership and managerial qualities in them so that they can deliver results in the organization they join.

Quality Policy

We, the staff, faculty and the management of Thakur Institute of Management Studies, Career Development and Research are committed to offer excellence in software education, conducive academic environment and state of-the-art infrastructure to our students.

We work as a team and interact with students in pro-active manner to achieve our Quality Objectives and fulfill all academic, statutory and regulatory requirements to entire satisfaction of our students as well as for continual improvement of QMS.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO-1 : To enable students to gain knowledge across all domains of Information Technology with in-depth understanding of their applications.

PEO-2 : To enable students to analyze problems and to design and develop software solutions using emerging tools and technologies.

PEO-3 : To enable students to continue Life-long learning, Research and Entrepreneurial pursuit in their chosen fields.

PEO-4 : To develop communication, teamwork, and leadership skills necessary to manage multidisciplinary projects and serve the society as responsible and ethical software professionals.

PROGRAM OUTCOMES (POs)

1. Apply domain specific knowledge of computing and mathematics for designing of software solutions for defined problems and requirements.

2. Understand and analyze a problem and suggest feasible solutions.

3. Design, evaluate, and develop effective solutions for complex computing problems to meet desired needs.

4. Design and conduct experiments and use research-based methods to investigate complex computing problems.

5. Use appropriate techniques and software tools for computing activities.

6. Understand and commit to professional norms, regulations and ethics.

7. Recognize the need for and have the ability to engage in independent learning for continual professional development.

8. Understand and apply project management principles, as a member or leader in multidisciplinary environments.

9. Effectively communicate technical information, both oral and written with range of audience.

10. Analyze societal, environmental, cultural and legal issues within local and global contexts when providing software solutions.

11. Work as a member or leader in diverse teams in multidisciplinary environments.

12. Use Innovation and Entrepreneurship for creation of value and wealth.

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Editorial

The seventh volume of the Research Journal, Tech Tonics – TIMSCDR Research Journal is a compilation of scholarly research papers and articles written by students of MCA (Masters in Computer Applications) course of TIMSCDR. The contents of the research papers and articles of this edition pertain to the application of Information Technology in the domains of Agriculture and Nutrition.

The Journal showcases the research endeavors of Post Graduate level students and helps them understand IT industry problems analytically or practically. These efforts also inculcate amongst the students the ability to think and elaborate new ideas in the dynamic field of Information Technology.

The Journal represents research work in various specializations in Information Technology like Internet of Things (IoT), Drones, GPS, and Remote Sensing and its applications in Agriculture and Nutrition.

To ensure originality of the research work, the research papers and articles were thoroughly checked for plagiarism and then selected for publication. The students got an opportunity to understand the relevance of standard research work through this academic exercise.

The seventh edition of Tech Tonics, Research Journal is a modest effort to encourage the young, enthusiastic and resourceful minds of the students to do research using latest techniques, and innovate and pen down emerging ideas in the field of Information Technology and its diverse Applications.

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RESEARCH PAPERS

Problems of Solid Waste Management in Indian cities

Guided by: Prof. Mira Gohil

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Abstract - **Solid Waste refers to the refuse, the solid and semi solid waste materials of a community except the night soil. Solid waste contains organic as well as inorganic matters. Solid waste management includes the entire process of dealing with solid waste ,starting from the collection from the primary source to ultimately disposing off it hygienically, so that their not be a nuisance or create any harmful effect on nearby community. The solid waste management involves, management at waste generation level, storage at the source of generation, primary collection, street cleansing, temporary storage at locality level, regular and periodic transportation of this temporarily collected waste to disposing sites and treatment plants.**

Keywords – **Food waste; Solid waste; Paper waste; Domestic hazardous waste**

I.   INTRODUCTION

India is a nation which is rapidly shifting from agricultural-based nation to industrial and services-oriented country. More over 31.2% population is now living in urban areas. There are over 377 million urban people are living in 7,935 towns/cities. These three mega cities—Greater Mumbai, Delhi, and Kolkata—having population of more than 10 million, 53 cities have more than 1 million population, and 415 cities having population 100,000 or more according to the census of 2011. India has very different geographic and climatic regions (tropical wet, tropical dry, subtropical humid climate, and mountain climate) and four seasons (winter, summer, rainy, and autumn) and accordingly residents living in these zones have different consumption and waste generation pattern.

Municipal solid waste (MSW) in most of the cities in India is a serious threat to urban environment. Poor solid waste management is a serious threat to public health and causes a range of external costs which may not be measurable. However, solid waste management (SWM) in the India mainly in urban cities has received less attention from Government and researchers than the other environmental problems, such as air and water pollution.

In this research paper we will cover the major problems or difficulties that arise when it comes to SWM. We will mainly focus on Solid waste in Mumbai City.

II.   CATEGORIES OF WASTE IN MUMBAI

A. Food Waste

In a city like Mumbai food which is waste is in large amount. The household and other source (Restaurants, Hotels, Stalls) produce large amount of food waste which are mostly not segregated from the dry waste. The food waste on an estimate contribute to a total of 35-40% to the overall waste Mumbai produces per day.

B. Plastic Waste

Plastic is a waste which doesn't degrade and need to be separate from the others wastes. In city like Mumbai we can see 4 out of 5 people ask for plastic bags in their day to day shopping. Plastic waste nearly contributes to about 30-37% of the waste generate by Mumbai per day.

C. Paper Wast

Since Mumbai is not much virtualized need of papers comes in to picture. Almost every office, stationery and every s ingle selling, renting or buying of goods and services need paper and so does with it comes the waste. 20-23% of waste is to be paper waste.

D. Other Waste

It may include hospital waste and all other waste. It contributes nearly 10-20% of the overall waste production.

III.   GENERATION OF MSW

Municipal solid waste may also be called as urban waste and is a waste type that includes predominantly household waste (domestic waste) with sometimes the addition of commercial wastes, construction and demolition debris, sanitation residue, and waste from streets collected by a municipality within a given area. They are in either solid or semisolid form and generally exclude industrial hazardous wastes. MSW can be broadly categorized into five broad categories as-

- Biodegradable waste: food and kitchen waste, green waste (vegetables, flowers, leaves, fruits), paper (can also be recycled).
- Recyclable material: paper, glass, bottles, cans, metals, certain plastics, etc.
- Inert waste: construction and demolition waste, dirt, rocks, debris.
- Composite wastes: waste clothing, Tetra Packs, waste plastics such as toys.
- Domestic hazardous waste (also called "household hazardous waste") & toxic waste: medication, e-waste, paints, chemicals, light bulbs, fluorescent tubes, spray cans, fertilizer and pesticide containers, batteries, shoe polish.

Sources of waste, waste generators & solid waste contents can be tabulated as below:

Source	Typical waste generators	Solid waste contents
Residential	Single and multifamily dwellings	Food wastes, paper, cardboard, plastics, textiles, leather, yard wastes, wood, glass, metals, ashes, special wastes (e.g., bulky items, consumer electronics, batteries, oil, tires), and household hazardous wastes.
Industrial	Light and heavy manufacturing, fabrication, construction sites, power and chemical plants.	Housekeeping wastes, packaging, food wastes, construction and demolition materials, hazardous wastes, ashes, special wastes.
Commercial	Stores, hotels, restaurants, markets, office buildings, etc.	Paper, cardboard, plastics, wood, food wastes, glass, metals, special wastes, hazardous wastes.
Institutional	Schools, hospitals, prisons, government centers.	Paper, cardboard, plastics, wood, food wastes, glass, metals, special wastes, hazardous wastes.
Construction and demolition	New construction sites, road repair, renovation sites, demolition of buildings	Wood, steel, concrete, dirt, etc.
Municipal services	Street cleaning, landscaping, parks, beaches, other recreational areas, water and wastewater treatment plants.	Street sweepings; landscape and tree trimmings; general wastes from parks, beaches, and other recreational areas; sludge.
Process (manufacturing, etc.).	Heavy and light manufacturing, refineries, chemical plants, power plants, mineral extraction and processing	Industrial process wastes, scrap materials, off-specification products, slay tailings.
Agriculture	Crops, orchards, vineyards, dairies, feedlots, farms.	Spoiled food wastes, agricultural wastes, hazardous wastes (e.g., pesticides).

- The waste generation in small cities is lesser than larger cities.
- The amount of solid waste generation is also directly related to the economic status of families.
- As per studies conducted by Tata Energy Research Institute, higher income group generate more solid waste than middle and lower income groups.
- The lower income groups in generate less than 1/3rd of solid waste than their higher income counter parts.

IV. PROBLEMS OF STORAGE OF SOLID WASTE AT THE SOURCE OF GENERATION

- In most of the cities in India, the scientific and systematic storage of waste at source is not in practice.
- The waste is normally thrown in nearby vacant areas, government vacant land, drains, streets etc.
- Because of waste thrown on the street the environment becomes ugly and unhygienic, so even in case of regular cleaning be Municipal Workers also, the city cannot be kept clean for more than 2-3 hours.
- At sources people generally don't arrange to provide proper dustbins, in residential, institutional and commercial areas.
- In case of open drains and large drains passing across the city, people throw waste and these drains are clogged, width of large drains are reduced because of continuous dumping.
- People generally use following items to collect waste at source: buckets, polythene packets, plastic bins, metal bins with and without lids.

- People generally don't take the waste to the designated points they carry it to nearby roads, railway tracks, open plots etc and generally people avoid walking to the designated disposal points.
- So when wind blows the heap of solid waste get carried away by wind and spread in large areas and when there are rain the problem get aggravated.

V. APPROACHES IN DEALING WITH SOLID WASTE IN INDIA

- The solid waste in Indian cities makes it unsuitable for processing operations like incineration, pyrolysis, etc. due to the high percentage of non-combustibles and moisture in the waste.
- There are number of indigenous methods developed in India which are very suitable in our situations and are profit generating, one such method is very famous in which the solid waste is first sieved to remove larger particles, constituents, further the waste is dried and screened to remove the sand plastic and metallic etc and converted in to small pellets.
- A binder could be used for pelletisation or the lignin in the vegetables matter in the garbage itself can also serve as a binder. The pellets are dried in a rotary hot air drier to around 8 to 10 percent moisture level and are then ready for use, the pellets have a heating value of 4000 kcal / kg and a bulk density of 500 kg / cum due to the high amount of biomass present in the Indian refuse.
- The fuel pellets are an excellent domestic fuel, since they burn without a smoke in contrast to charcoal and fire wood. Due to high heating value lesser quantity of the fuel can produce better heating in lesser time, this process will not only reduce the nuisance of ill disposed garbage but also be economical in terms of saving precious fossil fuels and fire wood. The pellets can also be used in small thermal power plants.
- Another indigenous treatment method developed from traditional Indian treatment processes for wastes is the Vermicomposting process developed and systematized by Bhawalker Earthworm Research Institute in Pune. This cost-effective method needs no complex equipment and negligible energy inputs. This process utilizes the ability of the earthworms to disintegrate the biodegradable portion of the municipal solid waste. The earthworm's gut provides ideal temperature, ph and oxygen concentration for the speedy growth of useful aerobic bacteria and actinomycetes and thus has a very high microbial density about 1000 times greater than in the surrounding soil. The worm also produces enzymes which break complex biodegradable matter present in the garbage into simpler compounds which are used by the microorganism.
- The earthworm is capable of feeding on the waste and reducing its size to 2 microns size thus providing a greater surface area for microbial action. The blood hemoglobin in worms has a

very high oxygen affinity and is thus available for the micro – organism in high concentrations. The oxygen rich micro – environment accelerates the aerobic decomposition and eliminates the anaerobic micro – organism.
- The micro – organism in the earthworm's gut produce useful compounds like antibiotics, vitamins, plant – growth hormones etc. which are all present in its vermin castings. They also destroy all the pathogens in the ingested waste thus rendering the vermin casting safe. These vermin castings make good bio-fertilizers. This is one of the cheapest and easiest methods of processing organic fraction of the solid waste.
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VI. RECOMMENDATIONS

- There is a dire need to educate and make aware the people to change their habits, so as to store waste at source, and dispose of the waste as per the direction of Municipal council and effectively participate in the activities of Municipal council.
- Clear guidelines relating to the kind of storage receptacles, segregation of waste etc. should be issued, offenders should be penalized.
- There should be segregation of non-biodegradable /recyclable waste at sources or at secondary collection point and methods like compositing should be used for biodegradable waste.
- There should be segregation of waste at the city level also for disposing the recyclable waste and hazardous waste properly.
- The food waste, vegetable and organic waste produced at source which are biodegradable should be stored in non-corrosive container preferably with cover / lid.
- Dry and recyclable waste should be stored in bag / sacks made of plastic / paper / cloth etc.
- All the domestic hazardous waste, electronic equipment waste should be stored in bags / sacks and should be disposed in notified safe areas.
- Separate community bins should be provided for dry and wet waste.
- For commercial areas and hotels the dustbins should be containers not more than 100 lts in size with handles on top or on sides with rim at base.

- In case of vegetable markets large containers complementing the transportation, system should be provided.
- For waste in meat and fish markets the containers should be non-corrosive and not more than 100lts.
- Biomedical waste from hospitals and nursing homes should be treated as per the provisions contained in Government of India, Ministry of Environment and Forest Biomedical wastes (Management and Handling) Rules -1998 .
- Wastes from construction sites, Demolition waste should be within the premises and not at all abstructing the road.
- Door step collection of waste by municipal workers and commercial areas should be ensured.
- All waste should be segregated in bio degradable, non-biodegradable waste before primary collection.
- Transportation to temporary source should be by handcarts / tricycles with detachable containers of 20 to 40lts capacity.
- For street cleansing sweeping operation should be broadly clarified as per the cleansing requirements.
- The time of sweeping operation should be synchronized with that of generation by dividing the city in to sweeper beats.
- Shovels should be used to pick the heaped waste and transfer to the containers.
- For temporary storage and in case of community bins, containers should be metal mobile containers in place of cylindrical cement bins, masonry tanks and space should be provided to accommodate 3-10 cubic meter size.
- In order to reduce waste at dumping site, Incinerators, composting methods can be used.
- The dumping should be done generally in low lying areas of city, open land available in out skirt of city.
- Every dumping site should be away from residential area or habitation.
- Dumping sites should preferably be barren land

- Sites should have proper access.
- Sites should have provision for workers shelter stay, tools, equipment, electronic weigh bridge etc.
- Private initiative is required in treatment and disposal solid waste.
- There are requirement of state legislation, rules or controls governing the solid waste management.

VII. CONCLUSION

We need to inform people that what waste they produce and what are the harmful waste and the ways to separate it. In order to maintain and segregate the Waste we need to first educate the people about the different types of waste they produce and also the harmful effects of these wastes on their family and to their surroundings. We also conclude that we also ourselves have to take responsibilities to separate the waste at the source level itself. Along with Municipal Authority other NGO's should also take interest in segregating the waste or maintain or educating people about it. There should also be a rule that their will fine on not separating the waste. Along with people it is also necessary to educate the Municipal people who pick up the waste that they should pick up the waste according to its category.

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Animal Stock Monitoring

Guided by: Prof. Sneha Rane

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Abstract - **Remote controlling on animals are carried out using such system which helps farmers to assists change in the behavior of the animals present in his farm. GPS collar is applied on the neck of animals to record its location with high frequency allows it to monitor activities carried out by animals. The main key for such technology is wireless sensor network.**

Keywords - **Animal behavior; Cattle database; Monitoring; High GPS sensor**

I. INTRODUCTION

Using such kind of system environmental impact on animals could be reduced and along with that we can also determine various strategies to improve the condition of animals. Quite a while back a biologists and natural researchers began utilizing radio-handsets and position information utilizing the Global Positioning System (GPS) to track and screen the conduct of free extending creatures. Utilizing such innovation it has expanding made accessibility of advancements for the remote gathering of information and the far reaching utilization of satellite-based earth-perception has prompted us joining these advances to enable us to comprehend creature's behavioral reactions , in spite of the fact that these advances is still a work in progress. By concentrate on consolidating information from various advances, for example, remote sensor gives an extensive variety of data which needs to transmit remotely and examination of such information gathered by gadget worn by creatures. New era of Wireless sensors presents the two difficulties and open doors for checking creature conduct and their collaboration with the earth.

We developed a remote sensor as a gadget that measures a physical amount and can transmit this data remotely to another area. Remote sensor systems are normally involved an accumulation of sensors with their own energy supply, remote correspondence, information stockpiling, and information handling capacity. Utilizing correspondences amongst sensor and the information from any hub can be diverted back to the web. To decide quantitative data, for example, biomass requires ground-based alignment of

remotely-detected picture. For instance, in mild districts satellite pictures are being utilized to assess field biomass and field development rate. Inside herbivore frameworks we get free data from remotely-detected pictures which is utilized to gather connections between the animal's scene inclinations and the derived vegetation attributes. These layers of induction present vulnerability, which might be decreased by specifically corresponding herbivore inclinations in view of GPS observing of herbivore development with their scene inclinations. Radio-transceivers and passive radio frequency identification (RFID) gadgets have been utilized to record data on animal ID and all the more as of late to investigate social associations. Specifically, handsets worn by a couple of creatures can gather data on social experiences. The gadgets, alluded to as contact or vicinity lumberjacks(loggers), record the date, time and span of a nearby experience. The between creature remove that is recorded as an experience by the closeness lumberjack can be balanced by shifting the transmission control setting of the gadget. Vicinity lumberjacks have been utilized to investigate social cooperation amongst bovines and calves and furthermore to investigate potential dangers of infection transmission by recording contacts amongst wild and trained animals.

II. BACK GROUND

This paper was taken into consideration to notify what kind of problem the cattle face. All the important disease of cattle is as follow

Health event
1.Anthrax disease in cattle
2.Black-Quarter
3.Foot and mouth disease
4.Rinder-pest
5.Mastistis
6.Fowl-Cholera (poultry)
7.Paratyphoid(poultry)

All the animal illness has the capacity to influence the human populace straightforwardly or in an indirect way. This can occur by either reduce in the nature of the sustenance or the amount of the nourishment or by a diminishing in other animal food items, for example, dairy and may likewise be by a lessening in creature control, (for example, in transport). In any case, it influences the animal and henceforth makes monetary and domesticated animals misfortune human, decreasing their asset. The medical issues of dairy cattle considered in this can differently affect the cattle's and their profitability. A few diseases can cause a high effect on creation while some can cause a critical danger of the life span of the cattle's. Some can impact the entire group wellbeing, and some can cause global exchange concerns.

III. EXISTING SYSTEM

There are different sensors attached to the body parts to check the change of animal behavior.
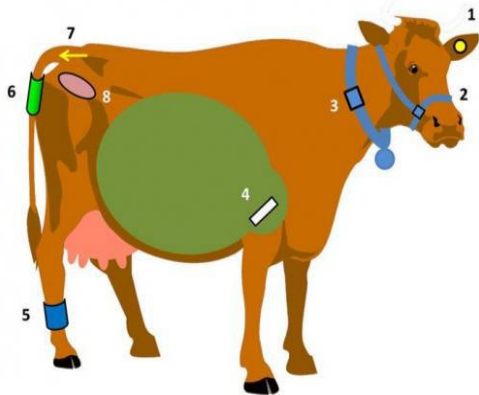
In the neck there is a collar which is made connected to GPS and RFID for making the relation within the database. There is a sensor attached to leg and tail part the tail part sensor is used to check urinal tract and breeding behavior of animals and the sensor attached to leg provides detail about the pain in the leg or some inflation in legs which could lead to disease. There is a tag attached to the animal's ear to know which cow is infected etc. There is another sensor attached at the intestine of the animal to check the digestive track of the animal. The regions to monitor cattle, this research has recognized three essential sensors: Temperature, Accelerometer and Microphone are used. The temperature sensor will help to determine if the animal has Hypothermia, Normothermia or Hyperthermy. The accelerometer will contribute to determining the activity or head and neck movement in the animal. The microphone is useful in determining if the animal is bellowing in distress, discomfort, pain or if is in heat. The microphone can also pick up the sound of breathing, grazing, rumination or coughing.

IV. PROPOSED SYSTEM

In our system there is only a collar attached to the neck of the animal cow, poultry, pigs, sheeps, goats. This collar will not only provide GPS location but also entire detail about the animal like about his health and behaviour condition and his surroundings. The collar will look like this
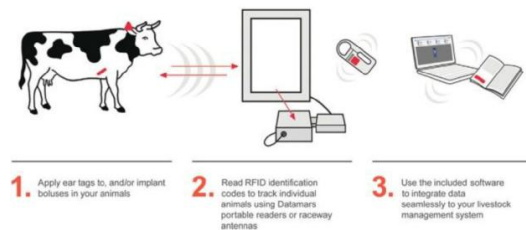
The above image is only an idea the real view will be more advance and along with the collar there will be a touch screen system will be provide with 15.6 size screen where the entire detail of the animal will be displayed. If needed we have attached a database also within our system so that if the farmer need to store the animal information for further processing can be needful. There will be no need for the farmer to do entire working process because once it is set the its for the life time.

V. METHODOLOGY

The product which we are developing is usually a collar which will have an RFID system through which we will get information about the cattle//poultry animals about their health the breeding level etc. A farmer or stock individual can distinguish these progressions inside a couple of minutes or hours. In any case, watching out for a herd can be somewhat of a test and ventures for counteractive action or treatment might be taken a bit past the point of no return at times. That is where out animal monitoring system arises. New technology detects the entire detail of the animal present in the stock and let the framer view these details in the screen. The screen will be in touch screen format and if there is any problem to animals then it will show pop up or the slot for particular animal will be in the red tag form.

Disease	Aspect of animal	Behavioral change	Sensor
Fever	High Temperature Discomfort	Less activity Animal voices(mooing, maee)	RFID along with temperature sensors
Mastitis	Sleeping behavior Reduce feeding	Less time laying down , kicking , weight shifting Less grazing	RFID other sensor into a single one batch
Milk Fever	Movement	Stiffness (animal voices), weakness, Temperature drop etc.	RFID Other sensor into a single one batch
Loose motion , pneumo nia	Nasal Discharge, Cough, Increased respitory rate	High temperature , Running nose, Coughing sound	RFID other sensor into a single one batch

VI. CONCLUSION

Using such kind of technology, we can make the animal healthy and in future we can even add the contact details of the veterinary doctors so that if any issues arises the detail will be directly forwarded to the nearby veterinarian doctors so that they can hospitalize the animal as soon as possible. This system is introduced to easy the work load of farmer.

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Study on GM seeds and Human Health

Guided by: Prof. Brijesh Pandey

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Abstract- **Genetically modified (or GM) plants have pulled in a lot of media consideration as of late and keep on doing so. Notwithstanding this, the overall population remains to a great extent ignorant of what a GM plant really is or what favorable circumstances and drawbacks the innovation brings to the table, especially with respect to the scope of uses for which they can be utilized. From the original of GM crops, two primary regions of concern have developed, to be specific hazard to nature and hazard to human wellbeing. As GM plants are step by step being brought into the use there is probably going to build open concern with respect to potential medical problems. Despite the fact that it is presently typical for the press to receive well-being efforts, the data they distribute is regularly problematic and unrepresentative of the accessible logical proof. We think of it as imperative that the medicinal calling ought to know about the cutting edge, and, as they are regularly the main port of require a concerned patient, be in a position to give an educated feeling.**

This research will look at how GM plants may affect on human wellbeing both straightforwardly – through applications focused at nutrition and enhancement of recombinant medicine production – yet in addition in a roundabout way, through potential impacts on the earth

Keywords- *Genetially Modified (GM).*

I. INTRODUCTION

Plants with good attributes have been created for a huge number of years by ordinary reproducing strategies. Attractive characteristics are chosen, joined and engendered by rehashed sexual intersections over various ages. This is a long procedure, taking up to 15 years to deliver new varieties.1 Genetic designing not just enables this procedure to be drastically quickened in a profoundly focused on way by presenting few qualities, it can likewise defeat the obstruction of sexual incongruence between plant species and tremendously increment the extent of the accessible quality pool.

Transgenic (GM) plants are those that have been hereditarily adjusted utilizing recombinant DNA innovation. This might be to express a quality that isn't local to the plant or to alter endogenous qualities. The protein encoded by the quality will present a specific attribute or trademark to that plant. The innovation can be used in various routes, for instance to design protection from abiotic stresses, for example, dry season, outrageous temperature or saltiness, and biotic anxieties, for example, bugs and pathogens, that would regularly demonstrate hindering to plant development or survival. The innovation can likewise be utilized to enhance the wholesome substance of the plant, an application that could be of specific use in the creating scene. New-age GM crops are presently likewise being created for the generation of recombinant solutions and mechanical items, for example, monoclonal antibodies, immunizations, plastics and biofuels

II. THE PROCESS

Various procedures exist for the generation of GM plants. The two most normally utilized are the bacterium Agrobacterium tumefaction, which is normally ready to exchange DNA to plants, and the 'quality firearm', which shoots tiny particles covered with DNA into the plant cell. Generally, singular plant cells are focused on and these are recovered into entire GM plants utilizing tissue culture strategies. Three parts of this system have raised open deliberation with respect to human wellbeing.

- The utilization of selectable markers to recognize changed cells
- Exchange of unessential DNA into the plant genome (i.e. qualities other than those being considered)
- The likelihood of expanded changes in GM plants contrasted with non-GM partners because of tissue culture forms utilized as a part of their generation and the improvement of DNA around the addition site of outside qualities.

Nourishments got from GM crops have been devoured by a huge number of individuals over the world for over 15 years, with no revealed sick impacts (or lawful cases identified with human wellbeing), regardless of a significant number of the purchasers originating from that most quarrelsome of nations, the USA.

III. INCREASING NUTRITIVE VALUE

In the developed world the nutritional ingredients of food items isn't of significant worry, as people approach a wide assortment of nourishments that will meet the greater part of their dietary needs. In the developing world, in any case, this is frequently not the situation, with individuals regularly depending on a solitary staple nourishment edit for their vitality consumption. GM innovation offers an approach to ease some of these issues by designing plants to express extra items that can battle malnutrition. A vital case of the capability of this innovation is the 'Golden Rice Project'. Vitamin A inadequacy is across the board in the world and is evaluated to estimation of roughly 2 million kids for every year. In surviving youngsters it has been distinguished as the main source of visual impairment. People can orchestrate vitamin A from its forerunner β-carotene, which is ordinarily found in many plants yet not in oat grains. The methodology of the Golden Rice

Project was to bring the right metabolic strides into rice endosperm to permit β-carotene union. In 2000, Ye et al.engineered rice that contained direct levels of β-carotene and from that point forward specialists have delivered the substantially higher yielding 'Golden Rice 2'.It is assessed that 72 g of dry Golden Rice 2 will give half of the RDA of vitamin A for a 1– 3-year-old kid.

Golden Rice was created for farmers in the poorest nations, and from the earliest starting point, the point of the researchers was to give the innovation gratis, which required the transaction of more than 100 scholarly and specialized property licenses.Golden Rice will be given to subsistence farmers with no additional conditions and is an impressive example of a health solution that can be offered by plant biotechnology.

IV.   ARE GM CROPS HEALTY TO EAT?

There is minimal reported confirmation that GM crops are possibly poisonous. An infamous report asserting that rats sustained with GM potatoes communicating the quality for the lectin Galanthusnivalis agglutinin endured harm to gut mucosa was distributed in 1999.Unusually, the paper was just distributed after one of the creators, Arpad Pusztai, declared this obvious finding on television.The Royal Society has since expressed that the investigation 'is defective in numerous parts of outline, execution and examination's and that 'no conclusions ought to be drawn from it': for instance the creators utilized excessively few rats for every test gathering, making it impossible to determine important, measurably noteworthy information.

Is there any from the earlier motivation to trust that GM harvests may be unsafe when devoured? The nearness of outside DNA successions in sustenance as such represents no inborn hazard to human health.All nourishments contain huge measures of DNA and RNA, devoured in the scope of 0.1– 1.0 g/day.Of potential concern is the likelihood that the protein created by the transgene might be dangerous. This would happen if the transgene coded for a poison that was thusly ingested fundamentally by the host. Be that as it may, the potential harmfulness of the protein communicated in a GM sustenance is a basic segment of the security evaluation that must be performed.40 Potential allergencity to the novel quality item is another usually communicated concern. Sensitivities to non-GM sustenance's, for example, delicate fleshed organic product, potatoes and soy are boundless. Unmistakably, new assortments of yields delivered by either GM methods or customary reproducing both can possibly be allergenic. Concern encompassing this subject identifies with two factors; the likelihood that qualities from known allergens might be embedded into crops not ordinarily connected with allergencity and the likelihood of making new, obscure allergens by either embeddings novel qualities into crops or changing the statement of endogenous proteins.

V.   CONCLUSION AND FUTURE WORK

Though there are many benefits of using GM crops because of it nutrient contents and high amount of production but we are not able to find effects of using/consuming GM crops in long term. Considering all the aspect of the GM crops we came to conclusion that gm crops are less harmful to human since long term negative effects of gm crops are not present. Various different strategies are introduced for producing gm crops.

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Use of GPS in Agriculture

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Abstract- **The improvement and execution of exactness agribusiness or site-particular cultivating has been made conceivable by joining the Global Positioning System (GPS) and geographic data frameworks (GIS). These innovations empower the coupling of ongoing information accumulation with precise position data, prompting the productive control and examination of a lot of geospatial information. GPS-based applications in accuracy cultivating are being utilized for cultivate arranging, field mapping, soil examining, tractor direction, trim exploring, variable rate applications, and yield mapping. GPS may help to study various field conditions.**

Keywords – **GPS; GIS; Precision agriculture**

I. INTRODUCTION

The developing sustenance requests due to consistently rising human populaces constrained world agriculturists to embrace asset serious and unsustainable practices that expanded both financial and natural expenses. Creating nations cultivating frameworks, subsequently, show the two deterrents and open doors for selection of accuracy farming. Fitting soil and yield administration to coordinate fluctuating conditions (soil surface, dampness, and supplement status and irritation dispersion) inside a field isn't completely new to ranchers. The cultivators generally noted yield inconstancy in space, time and changed ranch works on relying upon site conditions to enhance soil assets and outside sources of info. This was conceivable on the grounds that most creating nation's ranches were moderately little and agriculturists knew about spatial and transient variety. Be that as it may, the accuracy cultivating as far as utilizing advancements, for example, Global Positioning Systems (GPS), Geographic Information Systems (GIS) remote detecting, yield screens, direction frameworks for variable rate application to oversee inside field variety is still in its early stages in every single creating nation including India. Accuracy agribusiness is an incorporated yield administration framework that endeavors to coordinate the kind and measure of contributions with the genuine harvest requirements for little regions inside a homestead field. Exactness agribusiness is frequently alluded to as GPS (Global Positioning System)- based horticulture, variable-rate cultivating, remedy cultivating, site-particular cultivating and so on.

Man working ranch hardware Precision horticulture is currently changing the way agriculturists and agribusinesses see the land from which they procure their benefits. Accuracy agribusiness is tied in with gathering convenient geospatial data on soil-plant-creature necessities and endorsing and applying site-particular

medications to increment agrarian generation and ensure nature. Where ranchers may have once treated their fields consistently, they are currently observing advantages from micromanaging their fields. Exactness agribusiness is picking up in ubiquity to a great extent because of the presentation of high innovation apparatuses into the agrarian group that are more precise, financially savvy, and easy to understand. A significant number of the new advancements depend on the coordination of on-load up PCs, information gathering sensors, and GPS time and position reference frameworks.

Man operating farm equipment Precision agriculture is now changing the way farmers and agribusinesses view the land from which they reap their profits. Precision agriculture is about collecting timely geospatial information on soil-plant-animal requirements and prescribing and applying site-specific treatments to increase agricultural production and protect the environment. Where farmers may have once treated their fields uniformly, they are now seeing benefits from micromanaging their fields. Precision agriculture is gaining in popularity largely due to the introduction of high technology tools into the agricultural community that are more accurate, cost effective, and user friendly. Many of the new innovations rely on the integration of on-board computers, data collection sensors, and GPS time and position reference systems.

Many believe that the benefits of precision agriculture can only be realized on large farms with huge capital investments and experience with information technologies. Such is not the case. There are inexpensive and easy-to-use methods and techniques that can be developed for use by all farmers. Through the use of GPS, GIS, and remote sensing, information needed for improving land and water use can be collected. Farmers can achieve additional benefits by combining better utilization of fertilizers and other soil amendments, determining the economic threshold for treating pest and weed infestations, and protecting the natural resources for future use [1].

II. THE NEED FOR GLOBAL POSITIONING SYSTEM

Farm equipment tending precisely contoured rows of crops GPS equipment manufacturers have developed several tools to help farmers and agribusinesses become more productive and efficient in their precision farming activities. Today, many farmers use GPS-derived products to enhance operations in their farming businesses. Location information is collected by GPS receivers for mapping field boundaries, roads, irrigation

systems, and problem areas in crops such as weeds or disease. The accuracy of GPS allows farmers to create farm maps with precise acreage for field areas, road locations and distances between points of interest. GPS allows farmers to accurately navigate to specific locations in the field, year after year, to collect soil samples or monitor crop conditions.

Crop advisors use rugged data collection devices with GPS for accurate positioning to map pest, insect, and weed infestations in the field. Pest problem areas in crops can be pinpointed and mapped for future management decisions and input recommendations. The same field data can also be used by aircraft sprayers, enabling accurate swathing of fields without use of human "flaggers" to guide them. Crop dusters equipped with GPS are able to fly accurate swaths over the field, applying chemicals only where needed, minimizing chemical drift, reducing the amount of chemicals needed, thereby benefiting the environment. GPS also allows pilots to provide farmers with accurate maps.

III. GPS ROLE IN PRECISION AGRICULTURE

Precision Agriculture is doing the right thing, at the right place, at the right time. Knowing the right thing to do may involve all kinds of high tech equipments and fancy statistics or other analysis. Doing the right thing however starts with good managers and good operators doing a good job of using common tools such as planters, fertilizer applicators, harvesters and whatever else might be needed. [2]

In this context, GPS becomes part and parcel of precision agriculture. For analysis and processing of remote Sensed images requires ground truth information, collected in the field, at a variety of sites and often at various times throughout the crop production season. Conventionally this data has been manually recorded on field sheets, air photos or paper maps and considerable time and effort is required to convert it to digital format for use in remote sensing or GIS. For image analysis the ground data must be digitized in order to create a mask for training the software to recognize different conditions and classify the remote sensing imagery. We have developed an interactive, portable system to record field data directly into a digital database consisting of yield, soil, road, water and contour maps overlain on air photos or remote sensing imagery. A GPS receiver is linked to a note book computer displaying appropriate, pre loaded information layers, and a software package then combines incoming GPS signals with the displayed data to allow the user to see where they are with respect to the map components. The various layers of information can be easily edited and modified in the field and new data can be added as point or polygon layers and attribute tables [3].

The system also allows the user to save GPS data to view and track field activity at a later date. Data recorded in the field, such as the location of weed patches, field boundaries and crop condition noted can be moved easily to other GIS. Spreadsheet and image processing systems to enhance datasets and improve analysis. Yield Monitoring and Mapping: The most common use of GPS in agriculture is for yield mapping and variable rate fertilizer/pesticide applicator for yield mapping harvester travel speed and flow rate of material are measured. The yield is calculated as

Yield/area = (Flow rate) / (Harvester travel speed) x (effective harvesting width)

Grain yield monitors continuously measure and record the flow of grain in the clean grain elevator of a combine. When linked with a GPS receiver, yield monitors can provide data necessary for yield maps. Yield measurements are essential for making sound management decision. The yield maps are used to determine the cause of crop/soil variability. This in turn helps to make decision regarding space and time variable management practices. The variable rate applicators execute these management decisions [3].

IV. FUTURE PROSPECTS OF PRECISION AGRICULTURE AND GPS IN INDIA

Advances in GIS, GPS and Remote Sensing technologies are changing the way we will look at precision farming. The success of precision farming will be measured by the type of information that is provided to the farmer, how quickly the farmers were convinced. Competition for the farmers business should help in making the success a reality. The study on precision agriculture has been initiated in many research institutions. For Instance space Application. Center (ISRO), Ahmedabad has started experiment in the Central Potato Research Station farm at Jalandhar, Punjab to study the role of remote sensing, GIS and GPS in mapping the variability. M.S. Swaminathan foundation, Chennai, in collaboration with NABARD, has adopted a village in Dindugal district of Tamilnadu for variable rate input application. IARI, New Delhi has drawn up plans to do precision agriculture experiments in the institute's farm.

The use of GPS in Agriculture is limited but it is fair to expect wide spread use of GPS in future. Recently a GPS based crop duster (precision GPS Helicopter), which can spray an area as small as 4 X 4 mtr. is attracting great attention. Some progressive farmers are now beginning to use GPS for recording observations. Such as weed growth, unusual plant stress, colouring and growth conditions, which can then be mapped with a GIS programmes. In the years to come, GPS system role in precision agriculture may help the Indian farmers to harvest the fruits of frontier technologies without compromising the quality of land and produce.

V. BENEFITS OF GPS AND PRECISE FARMING

Precision soil sampling, data collection, and data analysis, enable localized variation of chemical applications and planting density to suit specific areas of the field. Accurate field navigation minimizes redundant applications and skipped areas, and enables maximum ground coverage in the shortest possible time. Ability to work through low visibility field conditions such as rain, dust, fog and darkness increases productivity. Accurately monitored yield data enables future site-specific field preparation. Elimination of the need for human "flaggers" increases spray efficiency and minimizes over-spray.

VI. CONCLUSION

We started using more digital technology in the last 10 years. We have gone to GPS (Global Positioning System) for a handful of different operations from cultivating to planting. By using GPS on the tractors, the entire process from leveling the field to planting the seed to irrigating the crop has been much more efficient than in the past. GPS is used in a lot of applications throughout most aspects of agriculture.

Precision agriculture is about collecting timely geospatial information on soil-plant-animal requirements and prescribing and applying site-specific treatments to increase agricultural production and protect the environment. Precision agriculture is gaining in popularity largely due to the introduction of high technology tools into the agricultural community that are more accurate, cost effective, and user friendly. Many of the new innovations rely on the integration of on-board computers, data collection sensors, and GPS time and position reference systems.

GPS equipment manufacturers have developed several tools to help farmers and agribusinesses become more productive and efficient in their precision farming activities.

Today, many farmers use GPS-derived products to enhance operations in their farming businesses. Location information is collected by GPS receivers for mapping field boundaries, roads, irrigation systems, and problem areas in crops such as weeds or disease. The accuracy of GPS allows farmers to create farm maps with precise acreage for field areas, road locations and distances between points of interest. GPS allows farmers to accurately navigate to specific locations in the field, year after year, to collect soil samples or monitor crop conditions.

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Information Technology in Green Revolution

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Abstract - **Agricultural practices and advancements differ globally—since plants have their own differences and the location plays a role on their development as well. But through the exchange of knowledge from different agriculturally-involved individuals from all over the world, improvement of techniques can be experienced as well. It has made an impact on how information is shared and being able to use this information for the advancement of the agricultural sector gives a great positive impact that is beneficial for everyone. IT has become a bridge for people from all over the world.**

Keywords - **Digital Technologies, VKCs, VRCs, e-choupal, MSSRF**

I. INTRODUCTION

Agriculture in India is the core sector for food security, nutritional security, and sustainable development & for poverty alleviation. It contributes approx. 18 % of GDP. Milestones in agriculture development in India includes: Green revolution, Evergreen revolution, Blue revolution, White revolution, yellow revolution, Bio technology revolution and the most recent one is Information and communication technology revolution[1].

IT supports new methods for precision agriculture like computerized farm machinery that applies for fertilizers and pesticides. Farm animals are fed and monitored by electronic sensors and identification systems. Selling or buying online began to become popular in the world. However, it's most important role remains communication, and the Internet has provided us with an ideal opportunity to do so.

Central, state governments and private organizations have taken IT measures for agriculture extension which include ITC- e-choupal, Kisan Kerala, Aaqua, Rice knowledge management portal , e-krishi, Mahindra Kisan Mitra, IFFCO Agri-portal, Village knowledge centers (VKCs)- M.S Swaminathan research foundation (MSSRF), village resource centres (VRCs)- Indian Space research organization, etc. We cannot go into the detail of each one, we will focus the important and recent ones, may be not given in the above list.

II. TRANSFORMING RURAL INDIA WITH THE HELP OF DIGITAL TECHNOLOGIES

IT is becoming the facilitator of socio-economic development in rural India with its obvious facilities by way of health, education, financial services and employment avenues, etc. It can help the bridge gaps by providing 'e' and 'm' services. IT offering meant for rural sector can be classified into three categories:
1. Those solutions which aim are aimed at empowerment.
2. Those which would do enablement.
3. Those for market expansion.

With respect to empowerment- e-choupal comes up as fine example.

This is example of efficient supply chain system empowering the farmers with timely and relevant information enabling them to get better returns for their produce. Due to its community centric approach, it gives other offerings also to the farmers' like- insurance and farm management practice, etc.

The practice of e-governance, which creates transparency and governance through IT, has enabled the citizens. Successful implementation of e-governance in the areas like- maintain land records is a great step in removing the malpractices and creating assurance of rightful ownership.

Aadhar is another such tool, which has empowered the masses by confirming their identities and is good example of IT solution attempting to provide access to monetary benefits by establishing the correct identity and this way rural economy is also expanding. Market expansion with the help of IT can be seen through various examples, such as – In recent years the village and heritage tourism in remote areas of the country has picked up a huge momentum and this has been done on account of awareness being created by the online portals, attracting more visitors compared to past.

Direct connect through e-commerce has facilitated large number of artisans agro-based small enterprises in rural areas. Women's livelihood is being facilitated amongst the weavers' community in the north eastern states by marketing their product through the internet medium. Indian rural market is going under transformation with better access to information. With the help of IT, farmers can use the services of FMC and can get better value for their product. As we know development is a process which takes couple of years to change the rural life. Thus information technology will definitely be in a position to change the scenario of rural life and create a better path for rural development.

Among the major States, Maharashtra was on top with the 104 out of 1,000 families had Internet in cities, followed by Kerala and Himachal Pradesh at 95 each and Haryana at 81.5.[2]

III. IT AND AGRICULTURE

Farming and Information Technology seems to be the most distantly placed knowledge sets in the world. Farming being the most primitive and most basic of the jobs and IT related being the most advanced and most modern.

- However we know the importance of farming as it is essential for life maintenance on the surface of mother earth and it is important for the developments in IT to aid for the betterment of farming to produce better.
- The information related to policies and programs of government, schemes for farmers, institutions through which these schemes are implemented, new innovations in agriculture, Good Agricultural Practices (GAPs), Institutions providing new agricultural inputs(high yielding seeds, new fertilizers etc) and training in new techniques are disseminated to farmers through use of Information technology to ensure inclusiveness and to avoid digital divide.
- Access to price information, access to agriculture information, access to national and international markets, increasing production efficiency and creating a 'conducive policy environment' are the beneficial outcomes of e-Agriculture which enhance quality of life of farmers.
- Soil Management, Water Management, Seed Management, Fertilizer Management, Pest Management, Harvest Management and Post-Harvest Management are the important components of e-Agriculture where technology aids farmers with better information and alternatives. It uses a host of technologies like Remote Sensing, Computer Simulation, and Assessment of speed and direction of Wind, Soil quality assays, Crop Yield predITions and Marketing using IT.
- In India, there have been several initiatives by State and Central Governments to meet the various challenges facing the agriculture sector in the country.
- The E-Agriculture is part of Mission Mode Project, which has been included in NeGP (under National E-governance Plan) in an effort to consolidate the various learnings from the past, integrate all the diverse and disparate efforts currently underway, and upscale them to cover the entire country.
- The MMP is to be operationalized by Department of Agriculture and Cooperation (DAC), and aims to provide services, such as:
  - Information to farmers on seeds, fertilizers, pesticides
  - Information to farmers on Govt. Schemes
  - Information to farmers on Soil recommendations
  - Information on crop management
  - Information on weather and marketing of agriculture produce
  - Government steps to provide e-aid to farmers

IV. NATIONAL MISSION ON AGRICULTURAL EXTENSION AND TECHNOLOGY

The aim of the Mission is to restructure and strengthen agricultural extension to enable delivery of appropriate technology and improved agronomic practices to farmers. This is envisaged to be achieved by a judicious mix of extensive physical outreach and interactive methods of information dissemination, use of IT, popularisation of modern and appropriate technologies, capacity building and institution strengthening to promote mechanisation, availability of quality seeds, plant protection etc. and encourage aggregation of Farmers into Interest Groups (FIGs) to form Farmer Producer Organizations(FPOs)[1].

- Under Bharat Nirman, has registered the increased tele-density in rural areas. And it is this base which is being used to provide 'm' service to farmers, giving them right information at right time.
- Universal service obligation fund (USOF) already launched wireless broadband Scheme in 2009. USOF is also funding the National Optical fibre network (NOFN), which is being managed by Bharat Broadband Network Limited. Bandwidth from NOFN will be eligible to give wide range of services to rural India.
- Pilot project scheme forMobile values added services (m-VAS)for rural women's Self-help group (SHG) is also part ofUSOF's Sanchar Shakti programme. In this the SHG on the basis of their activities are provided with information in local languages through SMS, outbound dialers (OBDs) and Integrated Voice response system (IVRS).
- Bharat Nirman Kendra, shall be a single window for providing the information on the NREGS and shall provide feedback on the quality of implementation of the program. The idea is to slowly move on the wage employment to self-employment by providing skill development facilities to the rural people and in the process gives a fillip to the rural economy. In future it can also become centre for e-enabled study or e-learning centre.
- For farm credit, service of IT is being harnessed like Smart Cards, Internet Kiosks and cell phone messaging. And also disbursement of all social security benefits through electronic benefit transfer to all rural areas. Mobile-enabled kisan card system to help the agricultural community engage in cashless transactions.
- **Kisan credit card**: It uses the IT to provide affordable credit for farmers in India. It was started by the Government of India, Reserve Bank of India(RBI), and National Bank for Agriculture and Rural Development(NABARD) in 1998-99 to help farmers access timely and adequate credit.
- The Kisan Credit Card allows farmers to have cash credit facilities without going through time-consuming bank credit screening processes repeatedly. Repayment can be rescheduled if there is a bad crop season, and extensions are offered for up to four years. The card is valid for three

years and subject to annual renewals. Withdrawals are made using slips, cards, and a passbook.

- Kisan Choupal in collaboration with Krishi vigan Kendra is a successful model in Bihar. It is being conducted in identified village on the basis of need assessment of the farmers by the scientists on agriculture and allied enterprises.

- At Kisan Chouapl, the dialogue/. Discussion /.problems solving is facilitated with help of Information technologies, showing technical videos to farmers, movies, etc. at the beginning of the choupal. This has increased the awareness of farmers on cropping practises and new techniques. This has also facilitated better and wider reach of the technologies in the farmer community.

- Kisan Call centre: An expert advisory system and the farmers needs to call the toll free number 1800-180-1551 to seek expert advice on different matters related to agriculture and allied sectors.

- Kisan SMS Portal: Here farmer keeps getting SMS messages providing information or delivering service or giving advisories on his mobile from experts, scientists and officers at various levels after once opting for messages on agricultural practices / crops of his interest. In short, messages are customized based on farmer's preferences in the language chosen by them.

- Existing databases of the farmers available with central and state government are being integrated with the portal. Those who are not registered, they need to register themselves with the system. They can register themselves by calling the Kisan call centre on the toll free number or through web portal or even SMS based registration is also available.

- The services of the portal include crop production, including horticulture, animal husbandry, dairying and fisheries. It sends messages relating not only production aspect but also marketing of produce, weather forecast, soil testing, etc.

- The Sandesh Pathak application, developed jointly by C-DAC Mumbai, IIT-Madras, IIIT Hyderabad, IIT Kharagpur, and C-DAC Thiruvananthapuram will enable SMS messages to be read out loud, for the benefit of farmers who may have difficulty in reading. It is usable by people who cannot read. A large population of farmers belongs to this category. So when they receive an SMS message either containing agriculture-related advice or some other thing, this app will read aloud the content.

- The app which is available for download from the Appstore of the Mobile Seva Project of government of India, is an Indian language SMS Reader.

- The app is part of the project launched by the Indian Government to help farmers read messages which may be of the following types: advice to solve farming problems — insect, disease, fertilizer or weed management; information on weather — such as forecasts; and updates on latest technology — for improving yield and much more.

- Village Knowledge Centre (VKC) serves as information dissemination centre providing instant access to farmers to latest information/ knowledge available in the field of agriculture, starting from crop production to marketing. A "VKC In-charge" who looks after the operations of the VKC mans every VKC.

- The VRCs are connected to Knowledge/Expert Centres like Agricultural Universities, Skill Development Institutes and Hospitals. Over 6500 programmes have been conducted by the VRCs in the areas of, Agriculture/horticulture, Fisheries, Live stock, Water resources, Tele health care, Awareness programmes, Women empowerment, Supplementary education, Computer literacy, Micro credit, Micro finance, Skill development / vocational training for livelihood support etc. So far, over five Lakh people have availed VRC services[4].

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V.   MORE ADVANCED USE OF IT IN FARMING

- Irrigate via smart phone: Mobile is playing a big role in monitoring and controlling crop irrigation systems. With the right equipment a farmer can control his irrigation systems from a phone or computer instead of driving to each field.

- Moisture sensors in the ground are able to communicate information about the level of the moisture present at the certain depth of the soil. This gives more precise control of water and other inputs like fertilizer that are applied by irrigation pivot.

- GPS mapping for an input to the field using variable rate technology, which helps farmer in accessing the need i.e. where they need to put more fertilizer or less, according to the requirement of the soil. GPS enabled services are also helping in field documentation about yield, moisture, maps for field drainage, etc.

- Various farmer friendly applications (apps) are being launched by companies, which helps farmers in discovering prices for their products, delivering their product, getting soil report, etc.

- One of the best use of IT in farming is being done by one vegetable farmer outside Hyderabad using webcams to monitor the crops and to take the scientists' expertise to address problems without taking them to the field.

VI.   BENEFITS OF E-AID TO FARMERS

- IT has made its way into the agricultural sector, and with positive results. To name a few, here are some of its effects.
- Improved decision making – By having the necessary information, farmers—big and small can make better and more informed decision concerning their agricultural activities. May it be about who to get their grains from or perhaps who to sell it to, the communication channels that information technology brings makes production up to distribution easier for the farmers. The exchange of knowledge from various countries and organization also helps farmers be more aware of factors to consider before making their decisions.
- Better planning– IT has paved the way to come up with farming software which can keep better track of crops, predIT yields, when to best plant and what to plant, to intercrop or focus on just one product, or determine the current need of the crops—just about everything needed to improve production and income.
- By adjusting to the modern farming methodologies, farmers can have better control of their crops. Gaining information from their farm is essential in sustaining its success and fuelling further growth.
- Community involvement – There are several programs which are made possible by IT applications, and community involvement in agriculture can be increased as well. When a community adopts modern methods for agriculture, the production of local goods can be increased.
- There are some places where people greatly benefit from the land and their resources for agriculture, and with IT, there can be improved union in local farmers which can lead to their community's overall improved production that may lead to better income for everyone involved.
- Agricultural breakthroughs – IT makes the spread of information concerning the latest agricultural breakthroughs more possible. When scientists develop new and improved grains or find techniques to help winter crops become stronger against the cold, farmers from all over the world may benefit from the same breakthroughs simply by being connected to the rest of the agricultural world. Sharing information to help everyone progress is made much easier through resources made available and accessible by IT.
- Agriculture for everyone – Farmers have in-depth knowledge when it comes to their trade. However, interested individuals who may be called backyard farmers may also benefit from how modern technology has changed how agriculture is seen. Growing your own sustainable garden of herbs, fruit trees, and other agricultural produce can be possible in a smaller scale. Planting is beneficial in more ways than one, and having your own produce even helps assure the freshness and quality of the food your family eats.

VII.   PRECISION AGRICULTURE(PA)

Satellite farming or site specific crop management (SSCM) is a farming management concept based on observing, measuring and responding to inter and intra-field variability in crops.

This technique focuses on utilizing resources optimally to improve the quality and quantity of crops while lowering the cost of production. It reduces fertilizer and pesticide use, prevents soil degradation, utilizes water optimally and raises productivity. Globally, this is done with the aid of modern, eco-friendly farming practices and technology, including satellite imagery and information technology. "This innovation can go a long way in tackling many of our country's farm ills, including excessive use of water and other inputs, which has hurt soil quality apart from making farming unprofitable as a profession.

VIII.   PROBLEMS IN EFFECTIVE USE OF TECHNOLOGY

Though lots of problems like feasibility of connectivity in rural areas, cost involved in ensuring services, need for basic computer literacy and literacy hinders the fast development of e-Agriculture, it will definitely be an engine of growth in Rural India once the initial hiccups are overcome.
Some of those problems are:-

- The reach of the technology is still very poor and large chunk of farmers are still ignorant about such advancements. The distribution of technologies is not uniform throughout the country. Farmers of prosperous states are at the receiving end like- Punjab, Haryana, Maharashtra and the farmers of backward states still practice their age old techniques and knowledge.
- The use of technology is being used by the already rich farmers and utilizing these services they are further prospering. The small and marginal farmers are again being left out in the process of development.
- Due to low literacy rate among farmers and digital divide, there is a rise of new class of middle man, who provide IT services to farmers. They are also believed to distort the information for their own benefit.
- The rural infrastructure for the use of IT is also not uniform and lot of regional disparity persists.

IX.   CONCLUSION

Now days the penetration of market forces in rural India is increasing and is potential market. With the diverse cultures and languages in India, IT provides a good platform here. Thus in future there would be substantial upliftment and sustainable development in rural areas.

ITs are changing all the spheres of human lives and agriculture cannot be an exception. ITs now may act as an agent for changing agrarian and farmer's life by improving access of information and sharing knowledge. The IT tools can change the ideas, activities and knowledge of the farmers.

Farmers feel empowered and can adopt appropriate measures at the time of need.

With the new extension of ITC initiatives like Krishivihar, i-Kisan,e-kutir, e-Sagoo, IT models- AGROWEB, Agropedia, AgrInnovate, etc. Indian agriculture has come to a long way and established several records in terms of production and productivity. IT had the potential to transform agriculture into a better prospect in the wake of climate change and decrease in the cultivable land.

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Why Indian Farmers have to shift towards modern cultivation methods?

Guided by: Prof. Sneha Rane

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Abstract - **Agriculture is the practice of cultivating soil for growing crops. Agriculture plays a vital role in Indian economy. Traditional method of cultivation is dependent upon rainfall to water the plants, so drought was a common issue. The quantity of food produced by traditional method of cultivation is less per hectare which causes starvation. Modern cultivation technique has helped farmer to increase the productivity of crops. It makes use of hybrid seeds, technologically advanced equipment and lot of energy subsidies in the form of irrigation water, fertilizers and pesticides.**

Keywords - **agriculture, soil, fertilizer, crop, farmer, cultivation, food, water**

I. INTRODUCTION

Agriculture is defined as the art, science or practice of cultivating soil, producing crops and raising livestock for economic or monetary purpose.[2] The word "agriculture" comes from Latin word "agri" means soil and "cultura" means cultivation. Agriculture provides us food and fabric. It also provides wood for construction and paper products. Agriculture is backbone of Indian economy. [2] Over 58 per cent of rural household depend on agriculture as their principle means of livelihood. Traditional method of cultivation can be categorized into use of fire for clearing a new plot, tillage by hand, planting on mounds and ridges, mixed cropping, lack of input for fertilizer and crop protection. Clearing heavily destroys the soil. [3]

Carbon, nitrogen and sulphur in the fallow and litter are lost in the burn. It also damages tree. Tilling is mostly done by hand.[4] A hoe with a large blade or ox-drawn ploughs is used for tilling. Deep ploughing is done which aggravates soil erosion.[4] Farmers make ridges while tilling. Initially ridges where make down the slope od hill. Downwards sloping ridges causes soil erosion.

Lack of fertilizer will damage the crop. It will even degrade the quality of soil.[4]

II. MODERN METHODS

Modern method of cultivation is used to cope with growing demand of population.

Modern cultivation techniques are:

A. *Micro-propagation*

Micro-propagation means growing plantlet in tissue culture where the environment and nutrition can be rigidly controlled.[3] Micro-propagation helps in large number of rapid generation of clonal plants of many plant species which are in many cases also virus free. [4] It is now the technical lead in generation of transgenic plant and somatically bred plant.[4] The practice of micropropagation is dependent on precis ice implementation of several technical aspect and development stages. [4]

B. *Monoculture*

Monoculture is the practise of growing only one crop in a field. It permits us to grow a particular breed of crop best suited for soil.[5] Monoculture help us to adjust the fertility level of soil precisely fit for one crop then it can be adjusted to fit all crop in rotation.[5] Monoculture based system usually offer great flexibility in planning the system to meet year to year changes in the need for various crops.[5] It helps us to shift from one crop to another without upsetting the total farm cropping plan. [5]

Fig 1: Monoculture Farming

C. Synthetic Fertilizer:

Synthetic fertilizer is manmade inorganic compound-usually derived from by-products of the petroleum industry.[3] Examples are Ammonium nitrate, Ammonium phosphate, Superphosphate and Potassium Sulphate.[3] Synthetic fertilizer helps to add nutrients to the soil.[6] When using synthetic fertilizers, application instructions should always be closely followed because synthetic fertilizers are made up of chemicals that may harm a plant's roots if applied too heavily.[6] Fertilizers are quickly released into soil which causes the plant to grow in abundant top growth. [6]

D. Irrigation:

Irrigation means artificial supply of water to the land and also artificial removal of excess water from land.[7] It is practised by more than half of the farmers because water supplied by rainfall is not enough for cultivation of crops.[7] Modern irrigation and the associated practice of drainage, together with the application of fertilizers and mechanization, have resulted in an unprecedented increase in farm productivity.[7] Twenty-five percent of the cultivated land in India is under irrigation.[7] The largest site, the Bhakra-Nangal project, receives water from the reservoir of Sutlej Dam at Bhakra and Nangal Dam in Punjab.[7] It irrigates more than 2 million acres (800,000 hectares) but has a capacity to expand. [7]

E. Hybrid varieties:

Hybrid varieties are used to increase the productivity of crop. The development of hybrid breed differs from hybridization in that no attempt is made to produce a pure-breeding population.[8] The greatest development of hybridization so far has been in corn because the male flower and female flower are easy to handle thus proving economical for production of hybrid seed.[1] A considerable amount of efforts has been taken to incorporate resistance and quality into new variety.

F. Horticulture:

Horticulture means the branch of plant agriculture dealing with garden crops, generally fruits, vegetable and ornamental plants.[9] The word is derived from the Latin "hortus", which means "garden" and "colere", which means "to cultivate." As a general term, it covers all forms of garden management, but in ordinary use it refers to intensive commercial production.[9] In terms of scale, horticulture falls between domestic gardening and field agriculture; though all forms of cultivation naturally have close links. [9]

Fig 2: Horticulture

III. ADVANTAGES

Modern technique of agriculture was very successful in meeting growing demand for food by the world's population.[10] Yields of primary crop increased dramatically, the price of food declined. The rate of increased in food yield generally kept pace with population growth and number of people who constantly go hungry was slightly reduced. [10] This boost in food production has been due mainly to scientific advances and new technologies, including the development of new crop varieties, the use of pesticides and fertilizers, and the construction of large irrigation systems. [10]

IV. DISADVANTAGES

Pesticides can kill useful insects as well as those that destroy crops. However, that excessive reliance on monoculture farming and agroindustry inputs, such as capital-intensive technology, pesticides, and chemical fertilizers, has negatively impacted the environment and rural society.[11] Most agriculturalists had assumed that the agroecosystem/natural ecosystem dichotomy need not lead to undesirable consequences, yet, unfortunately, a number of "ecological diseases" have been associated with the intensification of food production.[11] They may be grouped into two categories: diseases of the ecotope, which include erosion, loss of soil fertility, depletion of nutrient reserves, salinization and alkalinisation, pollution of water systems, loss of fertile croplands to urban development, and diseases of the bioeconomic, which include loss of crop, wild plant, and animal genetic resources, elimination of natural enemies, pest resurgence and genetic resistance to pesticides, chemical contamination. [10]

Chemical fertilizers can also become air pollutants, and have recently been implicated in the destruction of the ozone layer and in global warming.[10] Their excessive use has also been

linked to the acidification/salinization of soils and to a higher incidence of insect pests and diseases through mediation of negative nutritional changes in crop plants.[10] Use of fertilizers can alter the biology of rivers and lakes. Applied in either liquid or granular form, fertilizer can supply crops with readily available and uniform amounts of several essential plant nutrients.[12] Fertilizers, on the other hand, have been praised as being highly associated with the temporary increase in food production observed in many countries.[12] National average rates of nitrate applied to most arable lands fluctuate between 120-550 kg N/ha.[12] But the bountiful harvests created at least in part through the use of chemical fertilizers, have associated, and often hidden, costs.[12] A primary reason why chemical fertilizer pollutes the environment is due to wasteful application and the fact that crops use them inefficiently.[12] The fertilizer that is not recovered by the crop ends up in the environment, mostly in surface water or in ground water. [12]

Nitrate contamination of aquifers is widespread and in dangerously high levels in many rural regions of the world.[13] Such nitrate levels are hazardous to human health and studies have linked nitrate uptake to methemoglobinemia in children and to gastric, bladder and oesophageal cancers in adults.[13] The loss of yields due to pests in many crops. It is well known that cultivated plants grown in genetically homogenous monocultures do not possess the necessary ecological defence mechanisms to tolerate the impact of outbreaking pest populations.[13] Modern agriculturists have selected crops for high yields and high palatability, making them more susceptible to pests by sacrificing natural resistance for productivity.[13] On the other hand, modern agricultural practices negatively affect pest natural enemies, which in turn do not find the necessary environmental resources and opportunities in monocultures to effectively and biologically suppress pests. [13]

Use of chemicals on fields creates run-off, excess runs off into rivers and lakes causing pollution. Fertilizer nutrients that enter surface waters (rivers, lakes, bays, etc.) can promote eutrophication, characterized initially by a population explosion of photosynthetic algae.[14]

Algal blooms turn the water bright green, prevent light from penetrating beneath surface layers, and therefore killing plants living on the bottom.[14] Such dead vegetation serves as food for other aquatic microorganisms which soon deplete water of its oxygen, inhibiting the decomposition of organic residues, which accumulate on the bottom.
Eventually, such nutrient enrichment of freshwater ecosystems leads to the destruction of all animal life in the water system. [14]

V. SOLUTION TO THE DISADVANTAGES OF MODERN CULTIVATION

Under conditions of intensive management, treatment of such "diseases" requires an increase in the external costs to the extent that, in some agricultural systems, the amount of energy invested to produce a desired yield surpasses the energy harvested.[13] The spread of transgenic crops threatens crop genetic diversity by simplifying cropping systems and promoting genetic erosion. [13] In orchards and vineyards, the use of cover crops improves soil fertility, soil structure and water penetration, prevents soil erosion, modify the microclimate and reduce weed competition.[13] Entomological studies conducted in orchards with ground cover vegetation indicate that these systems exhibit lower incidence of insect pests than clean cultivated orchards.[13] This is due to a higher abundance and efficiency of predators and enhanced parasitosis. [13]

At the regional level, increases in monoculture farming meant that the whole agricultural support infrastructure (i.e. research, extension, suppliers, storage, transport, markets, etc.) has become more specialized.[14] As specific crops are expanded beyond their "natural" ranges or favourable regions to areas of high pest potential, or with limited water, or low-fertility soils, intensified chemical controls are required to overcome such limiting factors.[14] The assumption is that the human intervention and level of energy inputs that allow these expansions can be sustained indefinitely.[15] Reduction and, especially, elimination of agrochemical require major changes in management to assure adequate plant nutrients and to control crop pests.[15] As it was done a few decades ago, alternative sources of nutrients to maintain soil fertility include manures, sewage sludge and other organic wastes, and legumes in cropping sequences. [15]

Rotation benefits are due to biologically fixed nitrogen and from the interruption of weed, disease and insect cycles.[16] A livestock enterprise may be integrated with grain cropping to provide animal manures and to utilize better the forages produced.[16] Maximum benefits of pasture integration can be realized when livestock, crops, animals and other farm resources are assembled in mixed and rotational designs to optimize production efficiency, nutrient cycling and crop protection.[16] What happens is that some well-mentioned groups suffer from "technological eterminism", and emphasize as a key strategy only the development and dissemination of low-input or appropriate technologies as if these technologies in themselves have the capability of initiating beneficial social changes. [16]

VI.   CONCLUSION

This paperfocuses on how traditional   method failed to meet rising demand of need of the people. Traditional method of burning depleted soil nutrient, tilling used to lead to soil erosion, lack of fertilizer degraded the quality of crop and even failed to provide necessary nutrient to the soil and hence modern technique were used for cultivation it not only raised productivity but also helped in reducing labour work. It also helped to increase the quality of crop. Irrigation also provided artificial supply and removal of water now farmers no longer have to only rely on rainfall for cultivation of crop. It too has some disadvantages but it can be overcome easily.

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IoT Based Organic Farming

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Abstract - **Automation of farm activities can transform agricultural domain from being manual and static to intelligent and dynamic leading to higher production with lesser human supervision. This paper proposes an automated irrigation and compost system which monitors and maintains the desired soil moisture content via automatic watering. Microcontroller ATMEGA328P on Arduino Uno platform is used to implement the control unit. The setup uses soil moisture sensors which measure the exact moisture level in soil. This value enables the system to use appropriate quantity of water which avoids over/under irrigation. IoT is used to keep the farmers updated about the status of sprinklers. The traditional farm-land irrigation techniques require manual intervention. With the automated technology of irrigation, the human intervention can be minimized. Whenever there is a change in temperature and humidity of the surroundings these sensors sense the change in temperature and humidity and gives an interrupt signal to the micro-controller.**

Keywords - Automation, Microcontroller, Arduino Uno, IoT

I. INTRODUCTION

Agriculture is the unquestionably the largest livelihood provider in India. With rising population, there is a need for increased agricultural production. In order to support greater production in farm, the requirement of the amount of fresh water used in irrigation also rises. Currently, agriculture accounts 83% of the total water consumption in India. Unplanned use of water inadvertently results in wastage of water. This suggests that there is an urgent need to develop systems that prevent water wastage without imposing pressure on farmers. This paper focuses primarily on reducing the wastage of water and minimizing the manual labor on field for irrigation. It provides an alternative to a primitive method of irrigation in which an alarm intimates a farmer when water reaches a certain level of the farm [1]. The proposed system solves the problems of the existing system by automatically turning on/off the motor after particular time period. When moisture goes below a certain level, sprinklers would be turned on automatically, thus achieving optimal irrigation using Internet of Things. IoT helps organizations and individuals access information, facilitating major decision-making processes. It revolves around increased machine-to-machine communication and reduced human-to-human or human-to-computer interaction.

II. EXISTING SYSTEM

The existing system solves the current problem by supplying water to the plants with the help of an app or through a remote. If the existing system makes use of an app then simply user launches the app and gives input to the system through this app which turns on or off the water system. So the human intervention is brought to minimal level.

III. ADVANTAGE OF EXISTING SYSTEM

The existing system tries to minimize human intervention to minimal. Instead of manually going to the switch board and turning the motor on/off, person can simply turn on/off the motor through the app installed in their mobiles, from anywhere, inside specific range.

IV. DISADVANTAGE OF EXISTING SYSTEM

The existing system would fail if the person operating the system is not present. To operate the system the person requires to install the app in their phones and need to be in that particular range of field in which the system would accept the inputs [2]. The existing system can also lead to over irrigation.

V. PROPOSED SYSTEM

The product is developed for the farm level. The proposed system solves the problems of the existing system by automatically turning on/off the motor after particular time period [5]. The proposed system does not make use of any app or remote and simply depends upon the moisture sensors that are placed inside the farm in which the crop is to be grown. So even if the farmer is not present at that moment still the system turns on, water the crops and then turn off itself. As the system includes moisture sensor in it so it would supply only required amount of water to the crop and when the specific moisture is detected it would turn off the system thereby minimizing over irrigation.
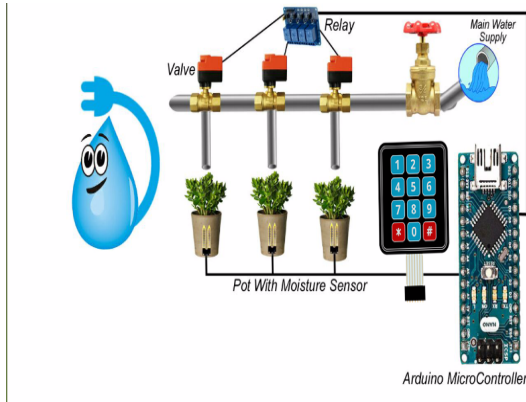
Fig 1: Irrigation System

VI. Advantage of Proposed System

The proposed system removes human intervention as the system would start and stop automatically.

The system would sense the moisture level in the soil so only required amount of water will be supplied to the plants. The system is cost effective as it would cost only around Rs.6516. The system also provides a keypad through which user can control the water level required for different plants.

VII. Disadvantage of Proposed System

The system requires continuous power supply. The water storage depends upon number of plants.

Table 1: Gantt Chart

VIII. FUTURE IMPLEMENTATION

The proposed system can be enhanced by adding the concept of rain water harvesting to it.

The plants would be kept inside a greenhouse where water will be collected from the roof of the greenhouse through pipes in a tank [4].

Also, before going into the tank, the water will be tested for its ph level with the help of ph sensor that are placed inside the pipes.

So if the water is suitable then it would be allowed to fall in tank and if the water is not suitable, then it is stopped from getting stored in tank and an alarm goes on.

To minimize power consumption, the system can make use of solar panels which would charge the system battery and so it can be used later.
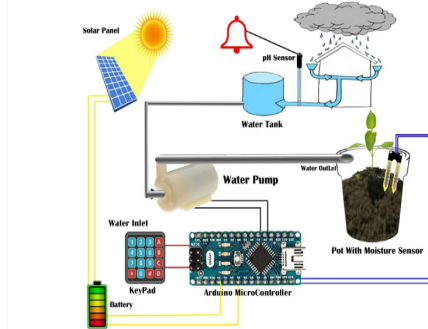

Fig 2: Smart Irrigation System

IX. CONCLUSION

The Flora Irrigation system is feasible and cost effective for optimizing water resources. The proposed system will definitely help in reducing wastage of water and in a way, it will also reduce human intervention. It does not require much technical knowledge for its implementation, So Even it can be used by the persons who are illiterate. As the majority of villagers of India are illiterate and poor so these systems can be used easily.

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Drones for spraying Pesticides:
The future of Agriculture

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Abstract: **Indian agribusiness required creation and in addition insurance materials to accomplish high efficiency. Fertilizer and chemical oftentimes needed to kill creepy crawlies. The WHO (World Health Organization) estimates there are more than 1 million pesticide affective cases every year. In that around one lakh death in every year, particularly because of the pesticides splashed by person. The pesticide influences the sensory system and furthermore prompts issue. A Remote Controlled Unmanned Aerial Vehicle (UAV) is utilized to splash the Pesticide. The vertical take-off and landing quad copter is utilized to shower the pesticide. This paper portrays the improvement of quad copter UAV and the sprayer module, talks about the combination of sprayer module to quad copter framework.**

Keywords: **Unmanned Aerial Vehicle, drones, quadcopter, manual spraying, pesticide sprayer, pesticide spraying mechanism.**

I. INTRODUCTION

The quadcopter is cost effective alternative to high cost standard rotorcrafts. UAVs are rapidly upcoming method for cultivation, production and protection processes. The quadcopter was chosen for this project because of high stability and more lifting power [5]. The control of quadcopter is easier than the helicopter model of vehicles. Some applications of quadcopter are Search and Rescue, Police, Code Enforcement/ Inspections, Emergency Management, Fire, Surveillance, Border Security, Defense, etc. The WHO (World Health Organization) estimates there are more than 1 million pesticide cases in every year. In that more than one lakh deaths in each year, especially in developing countries due to the pesticides sprayed by human being and handling of pesticides.

The health effects of pesticides include asthma, allergies and hypersensitivity, and pesticide exposure to cancer, hormone disruption and problems with reproduction and fetal development. Other pesticides may be irritated the skin and eyes. More pesticides are very dangerous carcinogens. Other pesticides maybe affects the hormone and endocrine system of the body. Even though very low levels of exposure during spraying may have leads to health effects. Pesticide exposure can cause a wide range of neurological health effects in body such as memory loss, loss of coordination, reduced speed of response to stimuli, reduced visual ability, altered or uncontrollable mood and general affects the hormone and endocrine system of the body. Even though very low levels of exposure during spraying may have leads to health effects. Pesticide exposure can cause a wide range of neurological health effects in body such as memory loss [3], loss of coordination, reduced speed of response to stimuli, reduced visual ability,altered or uncontrollable mood and general behavior, and reduced motor skills.

II. LITERATURE SURVEY

"Drones", to the growing number of farmers simply means a low-cost aerial camera platform either miniature fixed-wing airplanes or, more commonly, quad copters and other multiplied small helicopters. These aircraft are equipped with an autopilot using GPS and a standard point-and-shoot camera controlled by the autopilot; software on the ground can stitch aerial shots into a high-resolution mosaic map. Whereas a traditional radio-controlled aircraft needs to be flown by a pilot on the ground, in Kunde's drone the autopilot (made by my company, 3D Robotics) does all the flying, from auto takeoff to landing. Its software plans the flight path, aiming for maximum coverage of the vineyards, and controls the camera to optimize the images for later analysis. Remote sensing by Unmanned Aerial Vehicles (UAVs) is changing the way agriculture operates by increasing the spatial-temporal resolution of data collection. Micro-UAVs have the potential to further improve and enrich the data collected by operating close to the crops, enabling the collection of higher spatial-temporal resolution data. In that paper, they presented a UAV-mounted measurement system that utilizes a laser scanner to compute crop heights, a critical indicator of crop health. The system filters, transforms, and analyzes the cluttered range data in real-time to determine the distance to the ground and to the top of the crops. We assess the system in an indoor testbed and in a corn field. Our findings indicate that despite the dense canopy and highly variable sensor readings, we can precisely fly over crops and measure its height to within 5cm of measurements gathered using current measurement technology.

III. UAV

The main objective of this project is to reduce the ill-effects to humans. The quadcopter is used to spray the contents under any climatic conditions.

The UAV inbuilt sprayer contains a universal sprayer which is used to spray the both Fertilizer and Pesticide on a same sprayer. The Universal nozzle is used to regulate the Liquid content as well as solid contents. The pressure pump is used on a Pesticide spraying and not on Fertilizer Spraying. Multispectral camera is used to capture the remote sensing images which are used to identify the green fields as well as the edges of crop area. GPS navigation is used here for auto guidance system for UAV.

Fig 1: UAV spraying pesticide.

IV. HARDWARE SPECIFICATION

A. Arduino Uno: The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

B. BLDC(1800Kv): This is a brushless (BLDC) out runner motor specifically made for quadcopters and multirotor. It is a 1800kV motor. It provides high performance, super power and brilliant efficiency. The 30A ESCs can be used to drive the motor.

C. ESC: ESC is used to control BLDC motor. It takes signal from micrococtroller and breaks into 3 parts and sends it to the BLDC motor. We would require 4 ESCs as we are using 4 BLDC motor. The ESC generates three high frequency signals with different but controllable phases continually to keep the motor turning. The ESC is also able to source a lot of current as the motors can draw a lot of power.

D. MPU-6050: The InvenSense MPU-6050 sensor contains a MEMS accelerometer and a MEMS gyro in a single chip. It is very accurate, as it contains 16-bits analog to digital conversion hardware for each channel. Therefor it captures the x, y, and z channel at the same

time. The sensor uses the I2C-bus to interface with the Arduino.

E. Radio receiver: This receives 2.4GHz signals coming from the transmitter side. It has got 6 independent channels to receive the signal from the transmitter and then send the signal to the microcontroller for further processing.Its current consumption is less than 40 mA and works on 5volt power supply.

F. LIPO Battery: Lithium batteries are the preferred power sources for most electric modelers today. They offer high discharge rates and a high-energy storage/weight ratio. However, using them properly and charging them correctly is no trivial task. LiPo battery can be found in a single cell (3.7V) to in a pack of over 10 cells connected in series (37V). A popular choice of battery for a QuadCopter is the 3SP1 batteries which means three cells connected in series as one parallel.

V. SOFTWARE SPECIFICATON

A. Ardunio: Arduino is a tool for making computers that can sense and control more of the physical world than your desktop computer. It's an open-source physical computing platform based on a simple microcontroller board, and a development environment for writing software for the board. Arduino can be used to develop interactive objects, taking inputs from a variety of switches or sensors, and controlling a variety of lights, motors, and other physical outputs.The Arduino programming language is an implementation of Wiring, a similar physical computing platform, which is based on the Processing multimedia programming environment.

B.. EAGLE(Easily Applicable Graphical Layout Editor): 16-bit application for Microsoft DOS, with support for OS/2 and Windows added later on. Starting with version 4.0, EAGLE was converted to 32-bit. EAGLE version 4.0 also dropped support for DOS and OS/2, but was among the first professional electronic CAD tools available for Linux. A 32-bit DPMI version of EAGLE 4.0 running under DOS was available on special request in order to help support existing customers, but was not released commercially.Starting with version 4.13, EAGLE became available for Mac OS X, with versions before 5.0.0 still requiring X11. Version 5.0.0 officially dropped support for Windows 9x and Windows NT 3.x/4.x. EAGLE 6.0.0 no longer supports Mac OS X on the Power PCplatform (only on Intel Macs), and the minimum requirements have been changed to Mac OS X 10.6, Linux 2.6 and Windows XP.On 24 September 2009 Premier Farnell announced the acquisition of CadSoft Computer GmbH, developer of EAGLE.[1]EAGLE contains a schematic editor, for designing circuit diagrams. Parts can be placed on many sheets and connected together through ports.Free maintenance and support. Low cost, easy to use Printed Circuit Board design solution.

C. Multi wii: Multi Wii is an open source software project aiming to provide the brain of a RC controlled multi rotor flying platform. It is compatible with several hardware boards and sensors.It is portable, no installation required.MultiWii is a popular flight control software for multi-rotor craft. It performs well on most typical copters with minimal tuning and has a number of advanced features such as GPS position hold and return to home. MultiWii gets its name from early hardware versions which were built from parts scavenged from Nintendo Wii controllers, such as gyroscopes and accelerometers, which were connected to the popular Arduino micro-controller boards.

VI. WORKING

The quadcopter system is first switched on and this in turn causes the quadcopter to switch on. The joystick is kept at position zero. Once it is at position zero the gyroscope starts calibration and the indication light turns on, later blinks. After the light turns off the joystick is moved to position start 1. The throttle then is moved. After tha even if there is no input from joystick the readings from the gyroscope is taken and the quadcopter moves according to the readings of the gyroscope. When quadcopter moves to the desired location, the sprayer module can be turned on. After that the joystick is moved back to start 0 position. Once the joystick is in start 0 the motor gets turned off. Thus, the system gets turned off.
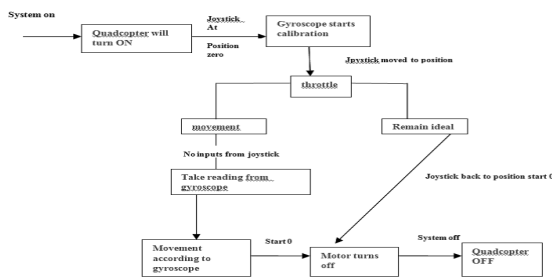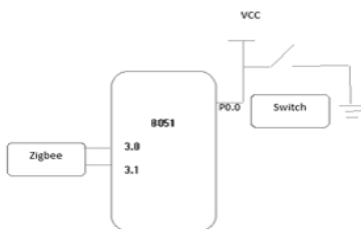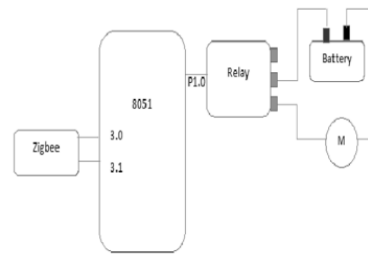

Fig.2: Working of quad copter.

Transmitter side:

Receiver side:

VII. RESULTS

The spraying time of pesticides is dependent on the quantity of pesticide to be sprayed. For example, for 1000 ml of pesticides, spraying time is around 5 minutes. If we want to increase the quantity of pesticide to be sprayed, the weight lifting capacity of the quadcopter must be increased. This is done by choosing higher specification of BLDC i.e more than 1000 rpm/kV. The flight time of the quadcopter is around 8 minutes. To in-crease the flight time we need to choose higher specification for LiPO battery. The height of spraying is around 6-7 feet[10]. The area covered is 10 feet by 10 feet. Table 1 shows various crops like cotton groundnut etc which are most affected by pests and the pesticides applied for each crop.

Table 1: Different crops and pesticides applied

Sr. No.	Crops	Name of Pesticides applied
1.	Cotton	aldicarb, carbaryl, carbofuran (Ib), chlorpyriphos, cypermethrin, decamethrin, demeton-S-methyl, dicofol (III), dimethoate, endosul-fan, fenvalerate (II), monocroto-phos, phosalone(II), phos-phamidon, quinalphos
2.	Groundnut	Carbaryl
3.	Sugarcane	Ammonium nitrate,Atrazine
4.	Pomegranate	Carfenterazone-ethyl,glyphosate,isopropylami ne salt

VIII. ADVANTAGES

1. In agriculture, application of pesticides and fertilizers is important at specific times and at specific locations to control pests.
2. Quadcopters are maneuverable, cheaper to operate, and require less capital costs
3. Quadrotor can be used to spray on hilly terrains.
4. Reduces ill-effects to humans while spraying manually.
5. Reducing the causalities due to pesticide exposures and hence prevents the encounters with the poisonous snakes like viper and cobra which are regularly found in our agricultural fields.
6. Increases the efficiency of spraying.
7. This can also be used in places where labourers are hard to find.
8. It can substitute 50 workers thus saving 50 workers from the harmful effects.
9. Reduces the time for spraying when compared to manual spraying.
10. Important savings(20% - 90%) in terms of water, chemical treatments and labor are expected.

IX. CONCLUSION

In this paper we have described an architecture based on unmanned aerial vehicles (UAVs) that can be employed to implement a control loop for agricultural applications where UAVs are responsible for spraying chemicals on crops[13]. The process of applying the chemicals is controlled by means of the feedback from the wireless sensors network deployed at ground level on the crop field. However precision agricultures about to know a further progress and UAVs will play a crucial role. Important savings(20% - 90%) in terms of water, chemical treatments and labor are expected. Flight regulations are an issue but UAVs, for most agriculture applications, have low weight and fly at low altitudes over uninhabited and private areas.

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Fostering Diabetic Nutrition through ICTs

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Abstract – **This paper discusses the diabetes and the lifestyles that are susceptible to diabetic illness. The various types of diabetes are explained, as also the role that the pancreas and insulin play in an individual's overall health and wellbeing. A survey to gauge the extent to which the general public is adhering to healthy lifestyles is discussed. The summary of the response to the survey is also discussed. The various ways in which ICTs can be used to monitor individual health are proposed. Some software applications which can be used to facilitate a healthy lifestyle and assist in weight control are also highlighted.**

Keywords – Diabetic, ICT

I.   INTRODUCTION

When one is asked which is the most common sickness that humans contract, the immediate answer would be cold, cough and fever. This is however not true. These are just symptoms of a disease that may mean much more.

Cold, cough, fever, etc. are very evident i.e. one can easily recognize these symptoms and then take the necessary medications. However, some diseases/disorders do not have very evident symptoms. Same is the case with diabetes. If detected too late, it may cause irreparable damage to the body. Hence, this paper tries to: (1) let people know whether they have the diabetic disorders; and (2) if so, then offer a solution, by the use of Information & Computer Technologies (ICTs).

II.   DIABETES

Diabetes is a group of disorders characterized by chronic high blood glucose levels (hyperglycemia) due to the body's failure to produce any or enough insulin to regulate high glucose levels.

Insulin is a hormone made by the pancreas that allows your body to use sugar (glucose) from carbohydrates in the food that you eat for energy or to store glucose for future use. Insulin helps keep your blood sugar level from getting too high (hyperglycemia) or too low (hypoglycemia).

The cells in your body need sugar for energy. However, sugar cannot go into most of your cells directly. After you eat food and your blood sugar level rises, cells in your pancreas (known as beta cells) are signaled to release insulin into your bloodstream. Insulin then attaches to and signals cells to absorb sugar from the bloodstream. Insulin is often described as a "key," which unlocks the cell to allow sugar to enter the cell and be used for energy. Thus, we see that it is very important that the right amount of insulin is present in the body.

There are two main types of diabetes:

1. *Type 1 diabetes*, which often occurs in children or adolescents, is caused by the body's inability to make insulin
2. *Type 2 diabetes,* which occurs as a result of the body's inability to react properly to insulin (insulin resistance).

Type 2 diabetes is more prevalent than Type 1 diabetes and is therefore seen in roughly 90% of all diabetes cases. Type 2 diabetes is predominantly diagnosed after the age of forty, however, it has now been found in all age ranges, including children and adolescents; and has become as common as cold, cough and fever.

The impact of diabetes is not only restricted irregular levels in the blood flow, but it is much more than that. Diabetes is the leading cause of blindness (diabetic retinopathy), end stage kidney diseases (diabetic nephropathy) and non-traumatic lower extremity amputations (diabetic neuropathy) in working-age adults. People with diabetes are also two to four times more likely to experience cardiovascular complications and strokes.

Timely detection is hence critical; before it can cause serious damage to the body. But how can one know that one has contracted Diabetes as it does not have evident symptoms? The answer to this is a person's weight.

A.   Relation to weight

The single best predictor of type 2 diabetes is overweight or obesity. Almost 90% of people living with type 2 diabetes are overweight or have obesity. People who are overweight or have obesity have added pressure on their body's ability to use insulin to properly control blood sugar levels, and are therefore more likely to develop diabetes. The number of diabetes cases among adults increased by a third during the 1990s, and additional increases are expected. This rapid increase in the occurrence of diabetes is mostly attributed to the growing prevalence of obesity.

B.   Prevention

Studies have found that lifestyle changes and small amounts of weight loss in the range of 5-10% can prevent or delay the development of type 2 diabetes among high-risk adults. Lifestyle interventions including diet and moderate to intense physical activity (such as walking for 150 minutes per week) were used in these studies to produce small amounts of weight loss. The development of diabetes was reduced by 40% to 60% during these studies, which lasted three to six years. Preventing weight gain, increasing activity levels and working toward small amounts of weight loss if you are overweight can have a big impact on the likelihood that you will develop diabetes in the future. Thus far, weight management is the best thing you can do to prevent the development of diabetes.

It is important to note that Diabetes cannot be cured, it can only be controlled. This requires proper medications and a healthy lifestyle.

III. SURVEY

The following questions were asked to a group of 25 middle aged people who are suffering from diabetes:

Q1) When did you find out that you were suffering from diabetes?

Q2) How often do you check your blood sugar?

Q3) Do you strictly follow the diabetologist's prescription?

Q4) Which other measures do you take to control diabetes?

Q5) Has your diabetologist asked you to visit a nutritionist/dietician? If yes, have you done so?

Q6) Do you think that diet plays an important role in controlling diabetes?

Q7) How often do you exercise?

Q8) Would you be interested in learning and using an application that will help you control your diabetes?

IV. RESULT

1) 45% people said that they found out that they were suffering from Diabetes after experiencing pain in other parts of the body (teeth, throat, back, etc.) which was not getting cured even after taking medicines.
2) 60% people said that they check their blood sugar every 3 months (because of the Diabetologist's insistence). 25% people said they check it every 6 months. 5% people said they check every month using the portable machine at home.
Remaining people do not check it at all unless they experience signs that their sugar has increased.
3) 75-80% people said they take their medicines as per prescription.
4) Majority of the people said that they avoid sweets like chocolates and other desserts as much as possible. Some have substituted sugar with sugar free substances.
5) 90% people said that they have been asked to visit a nutritionist/dietician. For others the diabetologist himself prescribes the diet.
Out of the 90%, only 20% have consulted a dietician and strictly follow the prescribed diet. Remaining have not consulted a dietician because they do not see any benefits of doing so and hence do not want to invest money in it.
6) This question had mixed answers. Some were aware that diet is important and so followed a strict diet, whereas some did so only because their doctor had asked them to do so. Others were ignorant about the issue. They were under the impression that only avoiding sugar would do the work for them.

7) 60% people said that they exercise regularly, however by exercise they only meant going for walks. Others said that they do not get the time to exercise or that they do not know what exercises they can do.
8) Around 60-70% people showed interest in learning and using the application. Others said they would probably be interested if they felt the need of it in future. A few (4%) showed total disinterest as they were satisfied with the way their medications are going on.

A. Derivation from survey

From the above result we can see that many people are only following a medical prescription. Many people do not even know the importance of Diet. Some have refused to consult Dieticians to save money. Others are unaware about the benefits of exercising.

Medicines will be continued life long, increasing or decreasing the dosage as per the instructions of the diabetologist. But one needs to also take care of their health personally.
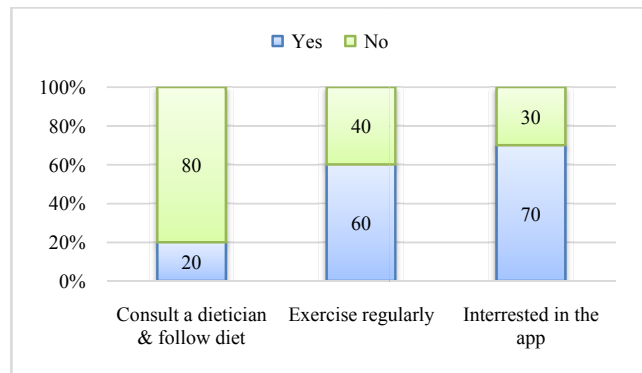

Fig. 1 shows summary of survey

V. PROPOSITION

Since we have seen that weight management is one way to control diabetes, we must focus on that aspect as well, along with the normal medications going on.

Weight Management can be achieved using IT. An application(app) that can help manage weight can be designed. The app aims at letting the user know their BMI and accordingly offers a solution to manage their weight.

It is also a better solution for people who do not wish to spend money on a Dietician, as this app is free of cost. The app suggests physical fitness activities and also a diet chart that can be followed by a person having Diabetes too.

The user needs to enter their height (in cm or feet) and weight (in kg or pound). The app will check their BMI with reference to the preset values and calculate their results. In addition, since the user is Diabetic, he/she will need to enter their blood sugar details too.

The app, after calculating the BMI, will suggest a diet according to the amount of weight the person needs to lose. In this way, we can integrate IT in the medical field and improve diabetic nutrition of a person suffering from Diabetes.

VI. CONCLUSION

changes and using medications to lower blood glucose levels. This weight management app is an easy and effective way to control Diabetes and live a healthy life. However, the effectiveness of the app will depend on the way user uses it. User needs to faithfully follow the solutions offered to see the desired and promised results. Also, people need to be aware of the importance of a healthy diet. There are also some people who do not recognize the benefits that IT can offer in maintaining a healthy lifestyle. However, soon with the increase in impact of IT, this too shall be taken care of.

One can have a positive influence on the blood sugar and overall health by choosing foods wisely, exercising regularly, reducing your stress levels, making modest lifestyle

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IoT based Smart Security
and Monitoring Devices for Agriculture

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Abstract - In the real world, many farmers face problemin monitoring their farms. The farmers have more difficulties to monitor all the farms at the same time. Hence the project is developed to monitor the farms in the field using the concept of IoT(Internet of things). Temperature level, soil moisture and water level are monitored according to the readings of these sensors and the pump is switched on to provide adequate water to the fields. Here all the data"s are parsed into the server and are able to monitor the plants continuously and easily able to monitor the health of farms. By using the IoT, the development time gets reduced and thus time for monitoring the farms. Also need not to worry about the health of crops and the readings are displayed in the server automatically through the wireless network. The pump can be switched ON or switched OFF from any part of the world using the concept IoT (Internet of Things). Moisture sensors sense the soil moisture content and switch on or off the pump according to the readings displayed in the web page. Temperature sensor sense the heat in the atmosphere, according to the climate, the switch will be automatically ON/OFF motor.

Keywords **-Peripheral Interface Controller;IoT; Sensors; A/D; Wi-Fi; SQL; HTML;PHP**

I. INTRODUCTION

Agriculture sector being the backbone of the Indian economy deserves security and hence an agricultural product needs security, monitoring and maintenance at very initial stage. These challenges should be taken into consideration. The combination of traditional method with software technologies like Internet of Things and Wireless Sensor Networks can lead to agricultural development. Keeping this scenario the concept "Internet of Things" have been tested and analyzed based on the device and is capable of analyzing the sensed information and then transmitting it to the user. This project can be used tocontrol and monitor the agricultural fields from remote location. This proposed system is oriented to provide smart irrigation and delivering real time notification based on information analysis and processing without human intervention. There are number of other factors that decrease the productivity to a greater extent.

Hence automation must be implemented in agriculture to overcome these problems. So in order to provide solution to all such problems, it is necessary to develop an integrated system which will take care of all factors affecting the productivity in every stage. But complete automation in agriculture is not achieved due to various issues. Though it is implemented in the research level it is not given to the farmers as a product to get benefitted from the resources. Hence this paper deals about developing smart agriculture using IoT and given to the farmers.

II. METHODOLOGY

In this section, the methods that available to involve in monitor and security system that given to agriculture field has to be discussed. Internet of Things fundamentally helps in mechanization. It acts like an interfaces between physical object around us. Electronic gadget like microcontroller implanted inside physical protest carries on like a genuine question and begins conveying. As per number of things associated with internet will surpass no .of individuals on earth in not so distant future. Cisco Internet Business Solution Group examinations that aggregate associated things will reach 50 billion out of 2020. Essentially major objective of IoT is to interface everything around us and empower consistent correspondence between them with exceptionally least human intercession. It centers association whenever, anyplace with anything.

In terms of security aspect IR/PIR sensor is used to identify the animals and human entry in the field and buzzer is used in altering them. While looking in terms of monitoring aspects the presence of water in the well is monitored and then the moisturizing level of the soil and the temperature of the surroundings are monitored. These values are monitored by using

can be controlled based on temperature and moisture level. The water level in the well is stated in two states as F (full/water present) and E (Empty state). If the water level is monitored as empty instead of pump motor is used for water extraction. In case of intruder the farmer will be alerted through webpage. Here when the intruder arrives the buzzer will be alarmed to scare the animals and give initial level of security. Then by using WIFI Module the values are stored as the data"s are updated for every minute

III. SIMULATION AND RESULTS

Proteus 8 is one of the easiest simulation software for various applications and circuit diagram of microcontroller. It has almost all microcontrollers and electronic equipment readily presence in it and hence it is widely used for simulate the program. The simulation has been done to check the feasibility of the proposed work. It can be used to test programs and embedded designs for electronic before actual hardware testing, The simulation of programming can also be done in Proteus.

IV. HARDWARE & SOFTWARE
IMPLEMENTATION

A. Hardware Implementation

In this chapter, the hardware implementation of smart irrigation system has been discussed. The components that are used for sensing and monitoring are connected to the controller. The display, Wi-Fi module and even the motor using driver is connected to PIC. Temperature and moisture level that are sensed by using respective sensors are parsed to web server using IoT.
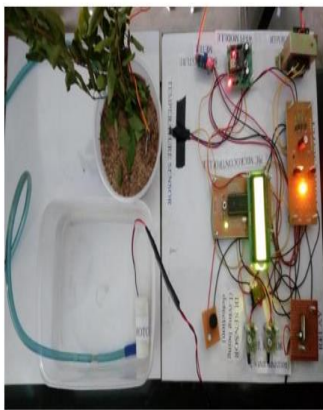
4. Hardware working model of Smart irrigation system.

The server can be accessed by the user manually or automatically it is operated to control the motor. LCD

displays the whole values and monitoring information for easy access. x Temperature and moisture sensor are dipped into the agriculture field. Temperature and moisture level are sensed by using sensors and the values are parsed to the web server and mobile using HOTSPOT and IOT. The server can be accessed by the user to control the motor. The motor ON/OFF control is given to the server. By using IR sensor the entry of trespassers, Animals and insects are detected and an alert message is send.Then the user can start buzzer to give an alarming signal.The IR sensor is used to indicate the water level that is used to switch ON/OFF the motor. The XAMPP control panel is used here to display the temperature, moisture, date and time, water content and security notifications to the user. Here the working model shown in fig 8 consists of connection made in the hardware components and the components names are labeled below each component. Here the submerge pump is kept in the water tank from where the water is taken out and moisture sensor is kept near the plant which automatically controls the pump by keeping the moisture value. Here LCD will be used for monitoring the temperature, moisture and motor status.

PIR SENSOR

PIR sensors don't detect or measure heat ,instead they detect the infrared radiation emitted or reflected from an object. It is used to detect the movement of the people, animals or other objects. They are commonly used in burglar alarms and automatically activated lighting system. When the human passes in the field, the temperature at that point will rise from room temperature. The sensor converts the resulting change into a change in the output voltage and this triggers the detection.

TEMPERATURE SENSOR
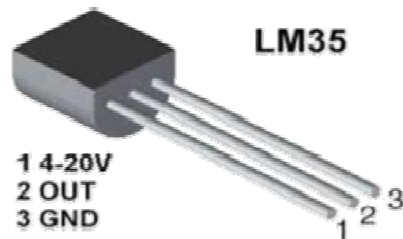
SOIL MOISTURE SENSOR
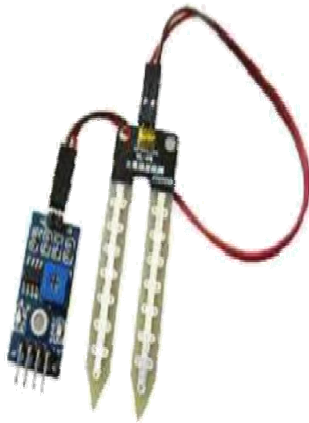
Soil moisture sensor is a sensor which senses the moisture content of the soil. The sensor has both the analog and the digital output. The digital output is fixed and the analog output threshold can be varied. It works on the principle of open and short circuit. The output is high or low indicated by the LED. When the soil is dry the current will not pass through it and so it will act as open circuit. Hence the output is said to be maximum. When the soil is wet, the current will pass from one terminal to the other and the circuit id said to be short and the output will be zero.

B. Software Implementation

The Webpage that is designed using PHP server and UI design of the webpage is done using HTML and CSS styling is done using Bootstrap files .The coding used for UI design of the webpage is given

as below: UI designing consists of three pages based on the application. The first page is Log in page. It consists of username and password. The list of users to access the webpage and the password for the respective users are stored in MySQL database. The server is contained with data from MySQL database that was named here as IoT. The second page consists of list of fields that need to be accessed and are represented by the diagrammatic images. The third page consists of details of the monitoring sensors values and the status of the pump is embedded into the table.

V. CONCLUSION

This proposed work is made to help the farmers and make their harvest economical by helping them in security purpose travelling side, college and for every bodies etc. By this work, the wastage of water and the consumption of power by motor can be reduced so that they are conserved for the future use. This system provides complete monitoring action of sensors in fields that is very easy to control the field. It also provides huge security to the plants.

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ARTICLES

Smart Agriculture with IoT

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Abstract – Farming assumes imperative part in the advancement of agrarian nation. In India around 70% of populace relies on cultivating and 33% of the country's capital originates from cultivating. Issues concerning agribusiness have been continually ruining the improvement of the nation. The main answer for this issue is keen horticulture by modernizing the current conventional techniques for agribusiness. Henceforth the undertaking goes for influencing farming to keen utilizing robotization and IOT advances. The featuring highlights of this undertaking incorporates shrewd GPS based remote controlled robot to perform assignments like weeding, splashing, dampness detecting, winged creature and creature terrifying, keeping carefulness, and so forth. Also it incorporates shrewd water system with brilliant control and savvy basic leadership in light of exact constant field information. Thirdly keen stockroom administration which incorporates temperature support, stickiness upkeep and burglary discovery in the distribution center. Controlling of every one of these operations will be through any remote shrewd gadget or PC associated with Internet and the operations will be performed by interfacing sensors, Wi-Fi or ZigBee modules, camera and actuators with miniaturized scale controller and raspberry pi.

Keywords – IoT; Smart agriculture

I. INTRODUCTION

Agriculture business is considered as the premise of life for the human species as it is the principle wellspring of sustenance grains and other crude materials. It assumes indispensable part in the development of nation's economy. It likewise gives extensive plentiful business chances to the general population. Development in agrarian division is vital for the improvement of monetary state of the nation. Lamentably, numerous ranchers still utilize the conventional strategies for cultivating which brings about low yielding of products and natural products. However, wherever computerization had been executed and people had been supplanted via programmed apparatuses, the yield has been moved forward. Thus, there is having to actualize present day science and innovation in the horticulture segment for expanding the yield. The majority of the papers implies the utilization of remote sensor organize which gathers the information from various sorts of sensors and after that send it to primary server utilizing remote convention. The gathered information gives the data about various natural components which in swings screens the framework. Observing ecological variables isn't sufficient and finish answer for enhance the yield of the products. There are number of different components that influence the profitability to extraordinary degree. These elements incorporate assault of creepy crawlies and nuisances which can be controlled by splashing the yield with appropriate bug spray and pesticides. Furthermore,

assault of wild creatures and feathered creatures when the yield grows up.

There is additionally probability of burglaries when edit is at the phase of gathering. Indeed, even in the wake of collecting, agriculturists likewise confront issues away of gathered yield. In this way, with a specific end goal to give answers for every such issue, it is important to create coordinated framework which will deal with all components influencing the profitability in each stage like; development, collecting and post gathering stockpiling. This paper along these lines proposes a framework which is helpful in checking the field information and additionally controlling the field operations which gives the adaptability. The paper goes for influencing horticulture to savvy utilizing computerization and IoT advancements. The featuring highlights of this paper incorporates savvy GPS based remote controlled robot to perform undertakings like; weeding, splashing, dampness detecting, flying creature and creature startling, keeping cautiousness, and so forth. Furthermore, it incorporates keen water system with savvy control in view of continuous field information. Thirdly, keen distribution center administration which incorporates; temperature upkeep, stickiness support and robbery identification in the stockroom. Controlling of every one of these operations will be through any remote brilliant gadget or PC associated with Internet and the operations will be performed by interfacing sensors, Wi-Fi or ZigBee modules, camera and actuators with miniaturized scale controller and raspberry pi.

II. LITERATURE REVIEW

The more up to date situation of diminishing water tables, becoming scarce of streams and tanks, eccentric condition exhibit an earnest need of legitimate use of water. To adapt up to this utilization of temperature and dampness sensor at appropriate areas for observing of harvests is actualized in.

A calculation created with limit estimations of temperature and soil dampness can be customized into a microcontroller-based entryway to control water amount. The framework can be fueled by photovoltaic boards and can have a duplex correspondence connect in view of a cell Internet interface that permits information investigation and water system booking to be customized through a website page.

The innovative improvement in Wireless Sensor Networks made it conceivable to use in checking and control of nursery parameter in accuracy farming. After the examination in the agrarian field, analysts found that the yield of agribusiness is diminishing step by step. Nonetheless, utilization of innovation in the field of farming assumes imperative part in expanding the generation and in addition in decreasing the additional labor endeavors. A portion of the examination endeavors

are improved the situation advancement of ranchers which gives the frameworks that utilization advances supportive for expanding the farming yield. A remote detecting and control water system framework utilizing appropriated remote sensor organize going for variable rate water system, ongoing in field detecting, controlling of a site particular accuracy straight move water system framework to augment the profitability with insignificant utilization of water was produced by Y. Kim . The framework depicted insights about the outline and instrumentation of variable rate water system, remote sensor system and ongoing in field detecting and control by utilizing fitting programming. The entire framework was produced utilizing five in field sensor stations which gathers the information and send it to the base station utilizing worldwide situating framework (GPS) where vital move was made for controlling water system as indicated by the database accessible with the framework. The framework gives a promising minimal effort remote arrangement and additionally remote controlling for exactness water system.

In the investigations identified with remote sensor organize, specialists measured soil related parameters, for example, temperature and moistness. Sensors were set underneath the dirt which speaks with transfer hubs by the utilization of successful correspondence convention giving low obligation cycle and henceforth expanding the life time of soil observing framework. The framework was created utilizing microcontroller, general offbeat beneficiary transmitter (UART) interface and sensors while the transmission was finished by hourly examining and buffering the information, transmit it and afterward checking the status messages. The disadvantages of the framework were its cost and organization of sensor under the dirt which causes weakening of radio recurrence (RF) signals.

III. SYSTEM REVIEW
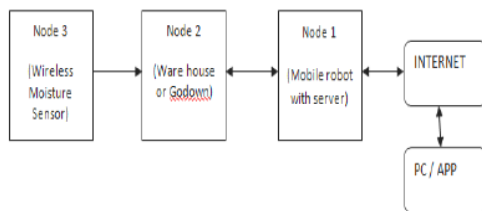
The paper consist of four sections; node1, node2, node3 and PC or mobile app to control system. In the present system, every node is integration with different sensors and devices and they are interconnected to one central server via wireless communication modules. The server sends and receives information from user end using internet connectivity. There are two modes of operation of the system; auto mode and manual mode. In auto mode system takes its own decisions and controls the installed devices whereas in manual mode user can control the operations of system using android app or PC commands.

IV. ARCHITECTURE OF SYSTEM

Node 1:

Node1 is GPS based mobile robot which can be controlled remotely using computer as well as it can be programmed so as to navigate autonomously within the boundary of field using the co-ordinates given by GPS module.

The Remote controlled robot have various sensors and devices like camera, obstacle sensor, siren, cutter, sprayer and using them it will perform tasks like; Keeping vigilance, Bird and animal scaring, Weeding, and Spraying

Node 2:

Node2 will be the warehouse. It consists of motion detector, light sensor, humidity sensor, temperature sensor, room heater, cooling fan altogether interfaced with AVR microcontroller. Motion detector will detect the motion in the room when security mode will be ON and on detection of motion, it will send the alert signal to user via Raspberry pi and thus providing theft detection.

Temperature sensor and Humidity sensor senses the temperature and humidity respectively and if the value crosses the threshold then room heater or cooling fan will be switched ON/OFF automatically providing temperature and humidity maintenance.Node2 will also controls water pump depending upon the soil moisture data sent by node3.

Node 3:

Node3 is a smart irrigation node with features like ; Smart control of water pump based on real time field data i.e. automatically turning on/off the pump after attaining the required soil moisture level in auto mode, Switching water pump on/off remotely via mobile or computer in manual mode, and continuous monitoring of soil moisture. In node3, moisture sensor transmits the data using HT12E Encoder IC and a RF transmitter. The transmitted data is received by node2 and there it is processed by microcontroller in order to control the operation of water pump.

V. CONCLUSION

The sensors and microcontrollers of each of the three Nodes are effectively interfaced with raspberry pi and remote correspondence is accomplished between different Nodes. All perceptions and test tests demonstrates that task is an entire answer for field exercises, water system issues, and capacity issues utilizing remote controlled robot, keen water system framework and a savvy stockroom administration framework separately. Usage of such a framework in the field can enhance the yield of the harvests and general creation.

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Integrated Automated Irrigation Sysyem

Guided by: Prof. Aparajita Singh

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Abstract - **In precise, like most of the watering technique is done manually, we here tend to make those watering farm technique automatically by implementing sensors Agriculture is a area which contributes to major part of food production in India[1].In our India monsoon season is the main season for the agriculture [5].Unlike a manually watering system, the automatic watering systems depends takes input from the sensors and thus provide equally amount of water that is needed for the farm. This technique is unique and not yet implemented. This would reduce the burden of farmers and also the risk of excess watering to the crops and everything implemented would be automated and hence resulting in the benefits of the farmers.**

Keywords **– Irrigation system; Sensor;**

I. INTRODUCTION

Agriculture is a area which contributes to major part of food production in India[1].In our India monsoon season is the main season for the agriculture [5].Unlike a manually watering system, the automatic watering systems depends takes input from the sensors and thus provide equally amount of water that is needed for the farm. This technique is unique and not yet implemented. This would reduce the burden of farmers and also the risk of excess watering to the crops and everything implemented would be automated and hence resulting in the benefits of the farmers.

Benefits of the automated system are:

- Simple to configure
- Saves resources and energy
- Precise for irrigation
- Cost effective
- Time saving

II. EARLIER SYSTEM

Earlier the farmer used to physically water the crops [2]. Thus somebody has to be present their physically to water the crops .It becomes hectic and also Their used to be situation when the excess amount of water been provided to the crop resulting in damaging the crop. This was due to lack of adequate knowledge of crops or the amount of watering it requires and also when that is the time stage of the crop when the water is to provide to the crops.

III. PRESENT STATUS

Currently, the irrigation system is not automated [5]. The farmer or the person in charge is physically present and waters the crops and plant out there. The risk of excess water thus remains here. Also, there is problem of water being not present to the farmers for watering or irrigating the crops. So, storage of water is also the main problem out there. The farmers so now a day only depend on the rain during the rainy season and on the vessels or the local storage of water in the other seasons. the irrigation currently whether canal irrigation, vessel irrigation, reservoir irrigation, river valley irrigation is being followed in India and none is automated currently [6]. There is human interference in this present system and do not assure proper irrigation. so main aim of our research paper is to basically provide a smart sensor-based irrigation system in India which is not done yet and the irrigation is carried out manually so far.

IV. SUGGESTED SYSTEM

The main problem in agriculture field is that of water [6]. The lack of water or the inappropriate supply of the water to the crop is one of them. Due to lack of water the farmers have to thus depend on next rain or someone others to land them water [1]. So, this problem can be resolved making a proper storage of water on a village level. There would be a central storage of a water in a given area maintained by government or respective area head. the system can also be maintained at the user side like in the android device or the PC at users end. The nodes connected would then be able to send data to central water system and thus it analyses it and responds with appropriate amount of water. Also, the information of different crops available will already be loaded in the centralized system [1]. There would be valves which would be atomically itself can on and off itself without any human interference. So because of this system the farmer would not have to water the crops in their field manually they just have to plant the seeds and automatically the water would be supplied to the field. The automated system would be fully computerized with sensors being installed to the fields where the water is to supply [2]. The sensors will automatically judge the different stages of the crop growth and will water them accordingly with the right amount of water being needed to them. The motors with sensors would be used if adequate water is supplied then the motor would

automatically have turned off [7]. The weather sensor would also be installed centrally where in the temperature and the rain would be sensed to auto fill the water tank which is been installed and also sense the humidity of the crops. Thus, the database is also required to store the previous analysed data and the data needed to be analysed furtherly. Wireless communication can thus take place between the system related on data soil value, water level values are thus being exchanged periodically so that accuracy is maintained. Thus, the values been produced by the sensors is converted digitally and shown in to the system.

V. CONCLUSION

Thus, the main aim of the project is water management for the agricultural land. In fact not only in agriculture it can also be used in all other places like cricket field, golf are, any garden out there, etc. However, this endeavour with time will be a good success as there is enough scope and a big need for automatic irrigation system to reduce the manpower and the mistakes made by them and also for the betterment of the agriculture sector in India and across the world. It is time saving and also reduces human errors in soil moisture level and thus maximizing the profit in quality, sales and growth of the process.

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AgriBots-Autonomous Farming Robots

Guided by: Prof. Brijesh Pandey

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Abstract - **Farm Robots or Agribots is a Robot expand for Agricultural purpose. The main area of Adopting the application of robotics in farming is at the Harvesting level. Emerging the robotics applications in agriculture includes planting seeds, weed control, cloud seeding, environmental monitoring and soil analysis. Robotics has the potential to address these challenges by replacing large farm machinery with autonomous robots. This paper presents our research toward the purpose of developing teams of autonomous robots that perform typical farming coverage operations.**

Keyword - **GNSS (Global Navigation Satellites System)**

I. INRODUCTION

Farming Robots are designed to replace human labour. Agribots have many benefits for agricultural industry, including best quality of produce, less cost production and smaller the need of human labour. Also can be used to automate human task such as weeding, spraying where the tractors use and other manned vehicles are too dangerous for the operators

II. PROBLEM DETECTION

Farmers are under pressure to increase production to feed a large growing population while managing environmental impact. The farmer must need to produce more, at high quality and in sustainable good manner. For some farmers, automation is already here. Planting is automated in vegetables, yet weeding and harvesting of crops, vegetables and fruit largely relies on farmers. Excess fertilisers also erode the land and effect on nearby waterbodies.

III. AGRIBOTS BASED FARMING

Making a robot economically requires the use of inexpensive sensors, such as cameras for avoidance of obstacles and for localization. we describe an obstacle detection system that continually adapts to environmental variations.

Rows assisted localization system that can conduct a robot through crop rows with a large and complex appearance. Large fleets of robots will become time-consuming to monitor and control. To reduce this, we invented a vision based docking system for autonomously refilling of liquid supplies.

Increase in productivity has largely been achieved with increasingly large and complex machinery to minimise the human operator's time and crop genetics and technical advances such as steering automation. These large machines cause significant soil compaction damage and present a single point of failure for time consuming farm operations. Many farming operations are also very time-consuming and repetitive Advances in robot technology have fuelled interest automating agricultural machines. Smaller autonomous machines cause less soil compaction, can work 24 hour a day.

The challenge is making a large autonomous robot economically viable, which requires using inexpensive sensors for localization and obstacle detection. With this, we can use stereo vision since it provides a rich source of information, including colour, texture, and structure information, and is also relatively cost effective. We describe a vision-based obstacle detection method that can detect novel obstacles while continually adapting to environmental and illumination variations. global positioning system (GPS) receiver with a vision-based crop row tracking method that functions in fields that vary substantially in appearance.

IV. SYSTEM DESIGN

The mechanical design focus on the systematic and functional design flexible robots designed to be suitable for a variety of agricultural tasks such as weeding, scouting, phenotyping, and other tasks. The projects focused on large broad-acre fields. The robot we developed for performing autonomous robot field experiments named as AgriBots (Agriculture Robots)

The AgriBot has two personal computers (PCs); PC runs the navigation, controller and localization and the other runs the obstacle detection. The robot's navigation system is an architecture that allows the robot to automatically run on a collision-free paths. We have modified this so that the robot returns quickly to the desired crop row after avoiding an obstacle.

The AgriBot has a forward-facing stereo camera pair for localization, encoders on the rear wheel, automated robotic arm use for various agriculture operations, also with gripper –is a grasping device used for harvesting the crop. Obstacle detection methods are popular due to the availability of laser scanners and are highly independent of observation property. The robotic arms consists of a spary nozzle attached to manipulator-ensures that the liquid is evenly distributed. Also allowed the chemical spraying constantly keeping distance from the target

The AgriBot has a 200-Litre tank with a level sensor and a 5-m-wide spray boom. Sensors include a forward-facing stereo camera pair, encoders on the rear wheels, GPS (Global Navigation Satellite System). It has a tricycle wheelbase that is driven and steered via the rear wheel, with the front two wheels providing differential measurements. It uses a forward-facing laser, tilted down at an angle of 11° for obstacle detection. The robot has a GPS to detect path to perform crop row tracking in these visually difficult conditions. This method avoids segmentation and is able to guide a robot parallel to crop rows in a wide variety of crop.

AgriBot Docking System- Farmers currently manually refill their machinery. However, a fleet of robots each with a relatively less payload will require frequent refilling, motivates the need for an automated docking system. To automate the refilling process liquid, we developed a docking system suitable for liquids such as herbicide, pesticide, and fuel.

The robot begins by GNSS to navigate. The robot then guides itself to the pose, and a small robot arm positions the discharge nozzle over the robot's funnel. Afterwards the robot communicates with the dock via the radio system to open an electronically controlled valve. A level sensor in tank determines when the valve should be shut. After filling, the robot leaves the dock. A failure detected by a time-out, results in restarting the docking procedure

V. CONCLUSION

The AgriBots are the close collaboration between the farmers and roboticists. Recent works have demonstrated that vision is a powerful sensor for robotics. This shown several methods in which vision can be used as the primary sensor for different functions of an agricultural robot such as obstacle avoidance, localization, and docking. The obstacle detection and localization systems used structure information from the pair and were both able to successfully operate in challenging environments. The vision-based obstacle detection system identifies novel obstacles by estimating a probability density. This allows adaptation to changes in illumination.

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Organic Waste Management

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Abstract- **Waste has been environmental problem everywhere. Waste includes all kind of trash, garbage, rubbish which school, colleges, offices, individuals, hospitals don't need and then discarded.A part of this waste is also organic which can be put to a better use rather than disposing it as 'waste'. The best way to use this waste is in agriculture by composting the waste. Waste Management is transportation,collection,recycling of waste i.e. to dispose all the unwanted waste.The method for managing waste is recycling and composting. Recycling involves conversion of waste such as aluminum, glass, plastic, paper into raw material to reuse it. Conversion of organic waste with the help of bacteria and moisture forms compost.**

KeyWords : **Organic waste;; Biological waste; Household waste; Compost**

I. INTRODUCTION

Organic waste material(bakery food, fruits or fruit peels,fast food, meal leftover, garden waste) can be used to make compost. Compost contains high nutrient soil which is used for agriculture. Organic matter contains carbon and nitrogen. Dumping of waste product openly also leads to land pollution.so, instead of dumping waste openly it can be used for agriculture. Recycling is processing waste organic material into compost. Compost making can also be done without using pesticides, herbicides, veterinary medicines as organic farming is a best way of farming. [1]

II. ANALYSIS

There is a different method used for dealing with organic waste in the developing nations. The word 'waste' is can be considered an inappropriate term for organic matter, which can be put to a good use. The economies of most developing countries dictates that materials and resources must be used to their full potential, and this has propagated a culture of reuse, repair and recycling. In many developing countries are making use of the waste to turn them into recyclable materials and earning a lot of profit out of this scavenger business.

III. WORKING

Compost making machine, compost all organic waste material into compost. The working is as such, all organic waste are collected into the container which contains crushing blades. Crushing blades helps the organic waste to crush into fine powder. Crushing of organic waste into fine powder helps the compost form early.
The fine waste material is then transfered to a tank. Moisture in the waste is then sensed below by humidity sensor. A humidity sensor senses moisture and air

temperature. If there is access moisture in the waste the heater turns on. The moisture evaporates and water gets collected in a container.
The compost tank contains mixing blade which mixes whole compost continuously. If the level of the compost increases and crosses maximum indicator then some compost should be removed. At the same time microorganisms decompose organic waste into compost. The amount of time a compost will take depends on the organic waste. The alarm rings once the compost is ready. This is shown in Fig.1 [4]
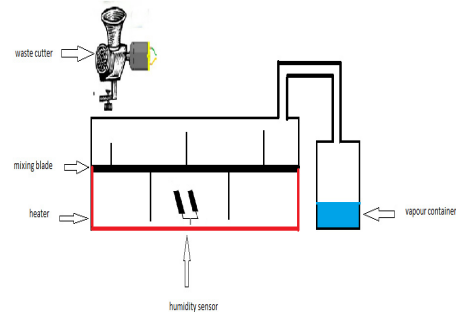

Fig1: Organic Waste Converter.

IV. TYPES OF ORGANIC WASTE

A. Domestic or household waste
The waste that usually comes out of leftover food,either cooked or uncooked, and waste from the gardens.However kitchen waste that is combined with plastic packaging cannot be composted.Since plastic is a non-degradable material.It is necessary to separate this kind of waste at source thus making recycling easier.[11]

B. Commercially produced organic waste
The waste produced at organizational buildings, such as schools, hotels and restaurants can also be put to use.The amount of waste spawned is extensive with respect to small intitutions .[11]

C. Biological waste
Even handling sewage has its own risks.Sewage contains infectious bacteria and pathogens that can be hazardous to our health.The people handling sewage should be aware of the risks invoved in sewage management and should be very careful with handling raw sewage.It is common sense to understand that biological waste should not be used as manure on plants or crops that are used for human or animal consumption.

D. Agricultural remains

The residue after the processing of crops including maize stalks, rice husks, foliage etc. make excellent manure. The variety of compost obtained is a long list which even extends upto manufacturing fuel etc.

V. ORGANIC WASTE BREAK DOWN METHODS

A. Anaerobic

In anaerobic decomposition, the bacteria and fungi that survive in low or no-oxygen environments decompose the organic waste.Closed containers are effective for such decomposition. The anaerobic system of decomposition is a man-made system that is quite expensive and iss recommended omly for large scale compost manufacturing.

B. Aerobic

In aerobic decomposition, bacteria and fungi that cannot survive in low oxygen conditions carry out the decomposition process. This decomposition takes place in open areas and containers that allow air to enter.This is the natural form of composting and the process is much faster. In heaps or bins where aerobic decomposition is occurring, there should be no unpleasant odours.

VI. ADVANTAGES

- Organic waste can be utilized for making compost.
- Land pollution can be controlled by using waste organic products instead of dumping openly.
- Compost is done without using chemicals.
- No manual work needed.
- Provides a useful way of regaining nutrients from organic remains.
- Prevents contamination of land and water caused due to garbage disposal.
- Increases fertility of soil.

VII. DISADVANTAGES

- Organic wastes need to be stored.
- Electricity consumption,which may be costly then doing it manually.

VIII. CONCLUSION

In this paper, a research on organic waste management has been discussed. Organics management has gone from an area that had not gained much attention during the first half of the 20th century to a revolutionary era in the early part of the 21 century.Using this technology will help us by making the world use a organic compost in agriculture . Even if there are some disadvantages, but they can be eliminated by being careful in further research.Organics management has begun to drift from urban myths to science. By using automatic compost machine there is less need of manual task. However, in future it will be beneficial to all the common people as it is automatic, so time saving and also organic farming is good for agricullture.

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Remote Sensing Technology in Agriculture

Guided by: Prof. Brijesh Pandey

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Abstract- Agriculture is the basis of national economy of India. Nowadays, the worldwide Earth Observation System (EOS) by Remote Sensing has been increasingly improved and the multi-temporal and multi-resolution EOS has been forming as well. Many of the remote sensing applications are especially made for the agricultural sector. Many of those applications exist, such as precision agriculture and irrigation management. The paper starts with an overview of the main agricultural challenges. This section is followed by a brief overview of existing operational monitoring systems. The review concludes with some key recommendations.

Keywords - **Yield estimation; Change detection**

I. INTRODUCTION

Remote sensing techniques are extensively used in agriculture and agronomy. The use of remote sensing is essential, as the monitoring of agricultural activities faces unique problems not ordinary to other economic sectors. Firstly, agricultural production follows strong seasonal patterns associated to the biological lifecycle of crops. The manufacture depends secondly on the physical background (e.g., soil type), as well as climatic driving variables and agricultural organization practices. All variables are extremely variable in space and time. Moreover, as productivity can modify within short time periods, due to unfavourable rising conditions, agricultural monitoring systems need to be timely. This is even more essential, as many items are unpreserved. Thus, as pointed out by the Food and Agriculture Organization (FAO) (2011), the call for for timeliness is a main factor underlying agricultural statistics and related monitoring systems—information is worth little if it becomes available too late.

Remote sensing can considerably contribute to providing a timely and precise picture of the agricultural sector, as it is very appropriate for gathering information over huge areas with high revisit frequency. The existing paper summarizes the most important remote sensing applications, with a focus on regional to global applications. It provides advice for enhancing investments in agricultural monitoring systems. It follows the tough conviction that a close monitoring of agricultural manufacture systems is necessary, as agriculture must strongly enhance its production for feeding the nine-billion people predicted by mid-century. This increase in manufacture must be achieved while minimizing the environmental impact of agriculture. Achieving this goal is tricky, as agriculture must cope with climate transformation and compete with land users not concerned with food production (e.g., biofuel production, urban expansion, *etc.*). The mandatory changes and transitions have to be monitored directly to provide decision makers with feedback on their policies and investments.

This review aims to offer an overview of recent remote sensing developments in terms of regional and global applications for agriculture. To exemplify the urgent need for an enhanced monitoring capacity, the paper is structured as follows. In the first part, the great challenges agriculture faces are presented and illustrated. Existing operational large-scale agricultural monitoring systems are briefly described in the next section. Finally, in the third and main part of the paper, an overview is given of important remote sensing applications within the agricultural sector. The focus is on regional to global information needs. Two main topics were chosen to illustrate the high potential of information derived from remote sensing. The two selected applications are: (1) biomass and yield estimation, (2) mapping of disturbances and land use/land cover changes.

II. AGRICULTURE IN A GLOBAL CONTEXT

A. Environmental Impacts of Agriculture and Future Pathways for Increasing Agricultural Production

Agriculture and natural resources are both under tough pressure. The major drivers are population growth, rising consumption of calorie and meat-intensive diets and an ever-increasing use of cropland for bio-energy production. The harmful impacts of current agriculture are manifold and can be linked to either agricultural expansion or intensification:

- biodiversity is endangered by land clearing and habitat fragmentation;
- greenhouse gas (GHG) emissions from land clearing, crop production and fertilization add already to 1/3 of global GHG emissions;
- global nitrogen and phosphorus cycles have been disrupted, with impacts on water quality, aquatic ecosystems and marine fisheries;
- fresh water resources are dwindling, as nearly 80 percent of freshwater currently used by humans is for irrigation. The environmental impacts of doubling global crop production will depend on how increased production is achieved. Manufacture could be increased by agricultural extensification or intensification. Extensification implies clearing extra land for crop production. Intensification, on the other hand, achieves advanced yields through increased inputs, improved agronomic practices (e.g., drop irrigation), enhanced crop varieties and other innovations.

III. EXISTING OPERATIONAL LARGE-SCALE AGRICULTURAL MONITORING SYSTEMS

Agriculture monitoring is not a fresh concern. In fact, the fundamentals of geometry and land surveying were developed in ancient Egypt. -The aim was assessing

cultivated areas affected by water level fluctuations of the River Nile, with the purposes of taxes and for preventing scarcity. Today, a local to global agricultural intelligence is essential to respond to various societal needs. For instance, national and international agricultural policies, global agricultural trade and organizations dealing with food security issues greatly depend on reliable and timely crop manufacture information.

Agricultural monitoring systems should provide timely information on crop manufacture, status and yield in a uniform and regular manner at the (sub) regional to the national level. Estimates should be provided as early as possible for the duration of the growing season(s) and updated periodically through the season until harvest. Based on the information provided, stakeholders are enabled to take initial decisions and identify geographically the areas with large variation in production and productivity. The system should offer homogeneous and interchangeable data sets with statistically suitable precision and accuracy. Possibly, only (satellite) remote sensing—joint with sophisticated modelling tools—provide such information in an appropriate manner, over large areas, in enough spatial detail and with reasonable costs.

IV. REMOTE SENSING OF AGRICULTURAL RESOURCES

Already in the early hours of 80s, it was shown by Tucker and co-workers that green vegetation can be monitored through its spectral reflectance properties. Today, a great range of satellite sensors offer us regularly with data covering a broad spectral range (from optical through microwave). Data are acquired from a variety of orbits and in diverse spatial and temporal resolutions. For deriving the sought information, a huge number of spectral analysis equipment's have been developed. Besides the spectral signature, useful information can also be retrieved by analysing the sequential signature and directional reflectance properties of plant life. Further helpful information can also be retrieved from the coclique arrangement of the pixels, i.e., the quality of the image, even at coarse resolution.

A. Biomass and Yield

In the early 80s, Tucker and co-workers established that arithmetic combinations of vegetation reflectance's in the red and near infrared are mainly useful for vegetation characterization. For instance, the well-known NDVI (Normalized Difference Vegetation Index) was already planned in 1978 by Deering. The index became, subsequently, the most fashionable indicator for studying vegetation health and crop manufacture. The accomplishment of the NDVI stems from its close relation to the canopy Leaf Area Index (LAI) and fAPAR (fraction of Absorbed Photosynthetically Active Radiation). -Due to its almost linear relation with fAPAR, the NDVI can be readily used as a circuitous measure of principal productivity. Dissimilar methods are discussed, ranging

from simple deterioration equations, to the use of more multifaceted crop growth models. For this reason, the current section focuses only on the so-called 'yield correlation masking'.

B. Disturbances and Land Use/Land Cover Changes

Monitoring the time and location of land-cover changes is essential for establishing associates between policy decisions, dictatorial actions and subsequent land-use activities. Regional shifts in land-cover and land-use have frequent consequences applicable to both environment and agriculture, together with changes in nutrient cycles, water quality and biodiversity.
Determining the corporal and temporal patterns of agricultural extensification or growth and intensification is the first step in accepting their implications, for instance, for long-term crop manufacture and environmental, agricultural and economic sustainability. Traditionally, either pre- or post-classification modification detection methods were useful to monitor land-cover changes. Both approaches disclose serious drawbacks. For instance, according to, factors that boundary the application of post-classification change detection techniques can consist of cost, consistency and propagation of errors. For instance, plants undergo intra-annual cycles linked to their growth and development patterns. During dissimilar stages of vegetation development, plant structures and associated pigment assemblages can vary considerably. Thus, the similar vegetation type can appear extensively different and different types similar, at a variety of stages during intra-annual growth cycles.

C. CONCLUSION

The review demonstrates the tough role remote sensing plays within the agricultural division. The remotely provided information is immediately needed for various decision makers. Requests for objective information will enhance in the future, as a result of the expected changes in the agricultural sector (e.g., meeting food requirements and environmental restrictions). For instance, for most crops, huge production increases (between 45 and 70%) are possible from closing yield gaps to 100% of attainable yields. Remotely sensed information can help with identifying yield gaps and monitoring correlated agricultural practices.

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ABOUT THE INSTITUTE

Thakur Institute of Management Studies, Career Development and Research was established in the year 2001 with a clear objective of providing quality technical education in tune with international standards and contemporary global requirements, offering 3 years postgraduate degree in Master of Computer Applications (MCA). The Institute is recognized by the AICTE norms and is affiliated to the University of Mumbai.

The Management's commitment to excellence is reflected in the marvelous infrastructure that is comparable to the finest institution of its type in the country. The sprawling campus with lawns, gardens, playgrounds, parking area, hostel accommodation and temple ensures a right academic ambience essential for a center of higher education.

At TIMSCDR, the importance of faculty is well understood which is reflected in qualified and experienced teaching staff. A closely monitored quality, assurance mechanism ensures proper coverage of syllabus within right time frame.

Application of modern technology in teaching-learning process and day to day governance of the Institute makes TIMSCDR unique. The organization supported by dedicated 16 Mbps broadband internet connectivity and also has WI-FI facility.

The Institute focuses on imparting knowledge to the students that persists even when they pass out and step into the corporate world. The syllabus has been given a new dimension through experienced faculty and state of the art infrastructure. The overall personality development through extra curricular activities like quiz, debates and seminars to name a few have been a hallmark of the Institute.