FARMWORK WITH ANIMALHUSBANDARY

PROJECT REPORT

Submitted in partial fulfillment of the requirements
For the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE & ENGINEERING

OF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR, ANATAPURAMU

By

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St. JOHNS COLLEGE OF ENGINEERING & TECHNOLOGY

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CERTIFICATE

This is to certify that the report entitled "**Farm work with animal husbandary"** being submitted by **B Sana Ayesha (21G31A0503),** in Partial fulfillment of the requirement for the award of the degree of **Bachelor of Technology** in **COMPUTER SCIENCE & ENGINEERING** in **St. JOHNS COLLEGE OF ENGINEERING & TECHNOLOGY** (Affiliated to Jawaharlal Nehru Technological University Anantapur) is a record of bonafide work carried out by them under our guidance and supervision.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

STUDENT'S DECLARATION

I hereby declare that this Project report titled **"B SANA AYESHA"** is an authentic work carried out by me as a student of Department of Computer Science and Engineering, St. JOHNS COLLEGE OF ENGINEERING & TECHNOLOGY, during 30th April 2023– 28th May 2023, in partial fulfillment of the requirements for the award of the Degree of **Bachelor of Technology in Computer Science & Engineering** is a bonafide report of the work carried out by me under the supervision of **Dr. P. VEERESH,** Department of Computer Science and Engineering, St. JOHNS COLLEGE OF ENGINEERING & TECHNOLOGY.

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CERTIFICATE FROM OFFICIAL OF THE COMMUNITY

This is **B Sana Ayesha** to certify that Reg. No 21G31A0503 of St. JOHNS COLLEGE OF ENGINEERING & TECHNOLOGY underwent in FARM WORK WITH ANIMAL HUSBANDARY PROJECT REPORT from 30th April 2023 TO 28th May 2023.

The overall performance of the Agriculture and Farming Project Report Volunteer during his/her project report is found to be GOOD (Satisfactory/Good).

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ABSTRACT

Animal products play an important role in the socio-economic life of India. It is a rich source of protein such as milk, meat, and eggs. India has emerged as the largest producer of milk with 21.32 per cent share in total milk production in the world. India accounts for about 5.65 per cent of the global egg production and also the largest population of milch animals in the world, with 191 million cattle, 109 million buffaloes, 135 million goats and 65 million sheep. This paper is based on the secondary data. Exports of animal products represent an important and significant contributions to the Indian Agriculture sector. During 2018-19, India's export of Animal Products was Rs.30632.81 crore which include the major products like Buffalo Meat, Sheep/Goat Meat, Poultry Products, Dairy Products, Animal Casings, Processed Meat, Albumin (Eggs & Milk), Natural Honey, etc. The demand for Indian buffalo meat in international market has sparked a sudden increase in the meat exports which dominated the exports with a contribution of over 89 per cent in total agricultural exports which dominated the exports was 23.49 percent during 2018-19. Growth in demand for meat in India's export markets, largely in Southeast Asia, the Middle East and Africa, has been strong relative to that in developed-country markets and is expected to remain so over the next decade. India may benefit from the opening of important new markets, particularly Russia and China. Export of animal products can be enhanced by taking on production process to stringent food safety and quality standards. Growing awareness among consumers about the importance of food safety, emergence of disease by consuming unsafe food and increasing paying capacity of consumers in both domestic and international market could further tackle this issue. Further, the cost of compliance, investment required, handling, processing and traceability of the products are some of the points that need to be emphasized to enhance animal exports. The arduous efforts made by the government by prioritizing the livestock sector to achieve the anticipated growth in Agri-sector have certainly enhanced the country's exports of various livestock products to newer heights.

India is transcendently an agrarian country, with farming utilizing 66% of the population. As far as the homestead region, India positions fifth on the planet. Ranches include an area of more than 180 million hectares. Farming records for close to 33% of India's public GDP. Agriculture is the art and science of cultivating the soil, growing crops and raising livestock. It includes the preparation of plant and animal products for people to use and their distribution to markets.

INTRODUCTION

. In the years to come, world Farm work will confront numerous challenges. The growth in the world's population, which may reach 9.5 billion people by 2050 compared to 6.5 billion today, will require a considerable increase in agricultural production destined for human and animal consumption (World Bank, 2007). If this increase will have to respect sustainable development outcomes, then it would have to produce at low-cost quality goods that can benefit the entire population, particularly the poorest, while limiting ecological impacts. Furthermore, this evolution will take place in a context of diminishing resources, notably of fossil fuels,
land, and water (Vance, 2001; Lang, 2008). Given such challenges, agronomic scientists must go beyond designing the isolated technical innovations that hitherto sufficed to increase production. They have to focus on designing innovative farming systems that can manage multiple and often contradictory objectives (Maynard et al., 2006). These systems could be developed at a scale such as the field and herd, based on the concepts of cropping system (Sibilate, 1990) and livestock breeding system (Be ´ranger and Vis sac, 1993). These concepts take into account the interactions between techniques implemented by farmers, their sequencing in time and space, and their impact on biophysical processes. However, it is increasingly necessary to focus on the scale of the farm and its sub-sets such as the areas devoted per crop.

Indeed, farmers allocate at that level available land, labour, equipment, and capital resources to the various tasks included in their production systems (Girard, 1988). Furthermore, various studies
show that farmers have more options at the farm level when technical solutions at the field level are difficult to implement (Aubry et al., 1998a)

Modern agronomy, plant breeding, agrochemicals, such as pesticides and fertilizers, and technological developments have sharply increased crop yields, but also contributed to ecological and environmental damage. Selective breeding and modern practices in animal husbandry have similarly increased the output of meat, but have raised concerns about animal welfare and environmental damage. Environmental issues include contributions to climate changes, depletion of aquifers, deforestation, antibiotic resistance, and other agriculture pollutions. Agriculture is both a cause of and sensitive to environmental degradation, such as biodiversity loss, desertification, soil degradation, and climate changes, all of which can cause decreases in crop yield. Genetically modified organisms are widely used, although some countries ban them. Agriculture provides most of the world's food and fabrics. Cotton, wool, and leather are all agricultural products. Agriculture also provides wood for construction and paper products. These products, as well as the agricultural methods used, may vary from one part of the world to another.

Agriculture is the foundation of India's livelihood, civilisation, culture and heritage. With a population of 1.39 billion, India is the second-most populous country in the world and is expected to overtake China as the most populated by 2027-30. With 328 million hectares (Mah) of land, India is the world's seventh largest country. India has ~160 Mah of arable land, the second largest after the US. The country experiences all 15 prominent climates. Moreover, India's landmass constitutes 46 of the 60 soil types found on the planet. It cultivates ~50% of its total geographical area, placing it among the top land users for agriculture. The proportion of cultivated land to the total geographical area often exceeds 90% in the more geographically suitable Indo-Gangetic Plain (IGP) and the deltas of the eastern coast. Indian agriculture, one of the world's oldest systems, is diverse, heterogeneous, unorganised and frequently subject to vagaries at various stages "from seed to market". It is a critical sector of the economy for the country's long-term and inclusive economic growth.

FARM WORK WITH ANIMAL HUSBANDARY
EXECUTIVE SUMMARY

Farmwork means the cultivation and tillage of the soil, dairying, the production, cultivation, growing, and harvesting of any agricultural or horticultural commodities. This includes the raising of livestock, bees, fur-bearing animals, or poultry, the farming of fish, and any practices (including any forestry or lumbering operations) performed by a farmer or on a farm as an incident to or in conjunction with such farming operations, including preparation for market, delivery to storage or to market or to carriers for transportation to market. It also includes the handling, planting, drying, packing, packaging, processing, freezing, or grading prior to delivery for storage of any agricultural or horticultural commodity in its unmanufactured state. For the purposes of this definition, agricultural commodities mean all commodities produced on a farm including crude gum from a living tree product processed by the original producer of the crude gum (oleoresin) from which they are derived, including gum spirits of turpentine and gum rosin. Farmwork also means any service or activity covered under 655.103(c) of this chapter and/or 29 CFR 500.20(e) and any service or activity so identified through official Department guidance such as a Training and Employment Guidance Letter.

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Figure 1FARM WORK WITH ANIMAL HUSBANDARY

Today, small farms produce about a third of the world's food, but large farms are prevalent. The largest one percent of farms in the world are greater than 50 hectares and operate more than 70 percent of the world's farmland. Nearly 40 percent of agricultural land is found on farms larger than 1,000 hectares. However, five of every six farms in the world consist of less than two hectares and take up only around 12 percent of all agricultural land.

Figure 2 FARM WORK AND USEAGE OF ANIMALS

NATURAL MANURING

Natural manure is the type of manure that is prepared from the biological wastes and decomposable materials. natural manure does not harm the soil health. These are derived from animal matter, animal excreta, human excreta, and vegetable matter. Naturally occurring organic fertilizers include animal wastes from meat processing, peat, manure, slurry, and guano.

Types of natural manures: -

PANCHAGAVYA:

It is a type of natural manure. it is prepared using the components like cow urine, could dung, ghee, toddy, coconut water, and curd. first take somehow dung, ghee and mix it. leave this mixture for 5 days, then mix the curd and leave it for a day. On the sixth day add toddy, coconut water, and cow urine, mix this every day once and within the 15 days, the panchagavya becomes ready to use. This mixture should be sprayed in the crop for a better crop.

Figure 3NATURAL MANURING WITH ANIMAL WASTE

VERMICOMPOST:

It is the type of natural manure. it is prepared by using the litter, vegetable waste, rotten fruits and earthworms. For preparing this we need to build a rectangular box of measurements in meters 12 x 1 x 3. now fill the box half with the topsoil. Now dispose of vegetable fruits waste and litter and rotten eggs etc. Now add 1000 earthworms per sq.m leave this for 1 month by sprinkling water daily thoroughly. this is done in a moist place. So that the earthworms would grow nicely and decompose the

materials easily. this can be applied in the crop**.**

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Figure 4MANURING USING INSECETS

USE OF ORGANIC FERTILIZERS

Application of organic fertilizers in melon production is a matter of great concern due to the fact that compost, produced under deficient conditions or contaminated with human pathogens as a consequence of incorrect handling, can present a high risk of biological contamination during production. Materials that are used traditionally for the production of organic fertilizers are animal, crustacean, and vegetable wastes. The first two represent an important source of human pathogens that must be inactivated during the production process of the organic fertilizer. The origin of the materials can define the type of microorganisms present in the compost if it is not produced correctly. Wastes of birds may contribute mainly *Salmonella* contamination, whereas enterotoxigenic *E. coli* can be introduced from waste of pigs or *E. coli* O157:H7 from cattle. Aerobic and anaerobic processes in organic fertilizer production reach adequate temperatures for the elimination of human pathogens, but it is necessary to verify the elimination of human pathogens in the compost by microbiological analysis of each produced batch.

The U.S. Natural Resources Conservation Service (NRCS) has a standard for operation of composting facilities (Code 317) to reduce the pollution potential of organic agricultural wastes to surface and groundwater. The requirements include, but are not limited to, ensuring that an operating temperature of 130 to 170 °F (54–77 °C) be achieved within 7 days and remain at these temperatures up to 14 days to ensure efficient composting (NRCS, 2005). The current regulation in the United States (AMS/USDA, 2008) requires that if raw animal manure is to be used as organic fertilizer, it must be composted unless it meets specific conditions for spontaneous composting, such as allowing at least 120 days between raw manure application and harvesting of a commodity that has been in contact with the soil so fertilized.

The increased consumer demand appears to be driven primarily by the perception that organically grown produce was safer and more nutrients to eat than produce grown conventionally. Similarly, the use of inorganic fertilizer has been observed to cause the destruction of soil texture and structure, which often leads to soil erosion and acidity as a result of the leaching effect of nutrients. All these give rise to reduced crop yields as a result of soil degradation and nutrients imbalance. Edmeades concluded that manured soil had higher organic matter levels, lower bulk density, higher porosity and hydraulic conductivity, and greater aggregate stability than soils fertilized conventionally Karlen and Stott, . Improvements in all of these soil quality indicators would optimize crop growth. Thus, one of the most significant benefits of manure as an organic nutrient source was the potential to maintain or increase soil organic matter levels.

Power and Doran, Microbial biomass and labile organic matter pools were often greater in organic than conventionally managed soils. Higher organic matter content, N mineralization potential, and microbial biomass were observed in organically farmed plots than in those receiving commercial fertilizers. Liebig and Doran, found greater total C and N, microbial biomass, soil respiration, and mineralizable N in organically managed farms than in conventional farms. In general, tissue dry matter content was reported to be higher in organically grown leafy vegetables, but not in fruit . Similarly, Heaton stated that dry matter produce from organic systems was higher than in conventionally grown produce. High rates of K fertilization have been reported to reduce dry matter content in some crops [26-41].

Therefore, it is recommended that the use of organic fertilizer or combined application is more beneficial than artificial fertilizers in order to preserve soil properties and increase the soil productivity.

Fig3.Organic Fertilizers

Organic fertilizers were different from chemical fertilizers in that the materials were a by- product of vegetables, animals or minerals. The decomposing matter from these sources, break down naturally and would provide nutrient and minerals to the soil. When considering lawn maintenance, it was necessary to make sure that the lawn or garden gets the all of nutrients that it needed for health growth. Although nutrients were available in regular soil, fertilizers can provide and ensure that the plant had a balance and suitable access of nutrients, proper lawn care include providing for the health of the lawn and garden. One of the benefits of organic fertilizer was that the nutrients were related more slowly than chemical fertilizers. This slower process allows the plant to process the fertilizer in a more natural way and will not result in over fertilizing which could damage the plant [10]. The soil drainage and air circulation of the soil can also be improved.

Having a compost pile was also a great way to get rid of food waste and still contribute to your lawn care and environment. It was an important valuable option that would help the soil and environmental be health and produce the best plants. Synthetic fertilizers usually contain chemicals which were not easily biodegradable. These chemicals leach into the soil and eventually find their way into the water system where they were consumed by birds and other wildlife. In contrast, organic fertilizer had no such harmful compounds and therefore didn't pose this danger, even with increased use. In addition, when synthetic fertilizers were sprayed on plants and lawns, they pose an immediate danger to kids and pets that play in the garden and on the grass. Caution must be exercised when using these toxins, and exposure must be limited. Unlike chemical fertilizers, organic fertilizers reduce acidity in the soil and do not cause leaching.

ENRICHMENT OF SOIL

Decomposition is the natural process of soil enrichment:

- When a plant, animal, or insect dies, that plant, animal, or insect is broken into tiny pieces and those pieces become part of the soil. This is called decomposition.
- Bacteria, fungi, and some worms are what break down dead plants, animals, and insects.
- The bacteria, fungi, and worms are called decomposers. Decomposers need to eat some of the dead things so they can live and grow.
- The tiny pieces left over after decomposers eat become part of the soil. Living plants take what they need from these pieces so they can grow.

This process is expected to determine the best and most cost-effective soil enrichment method suitable for the best and right source of compost nutrients for the fauna and flora, improve soil quality, enhance insects' growth and encourage growth of beneficial organisms, train the people of the society and applied the concept to enrich farmlands and improve crop growth and yields and reduce the issue of waste management.

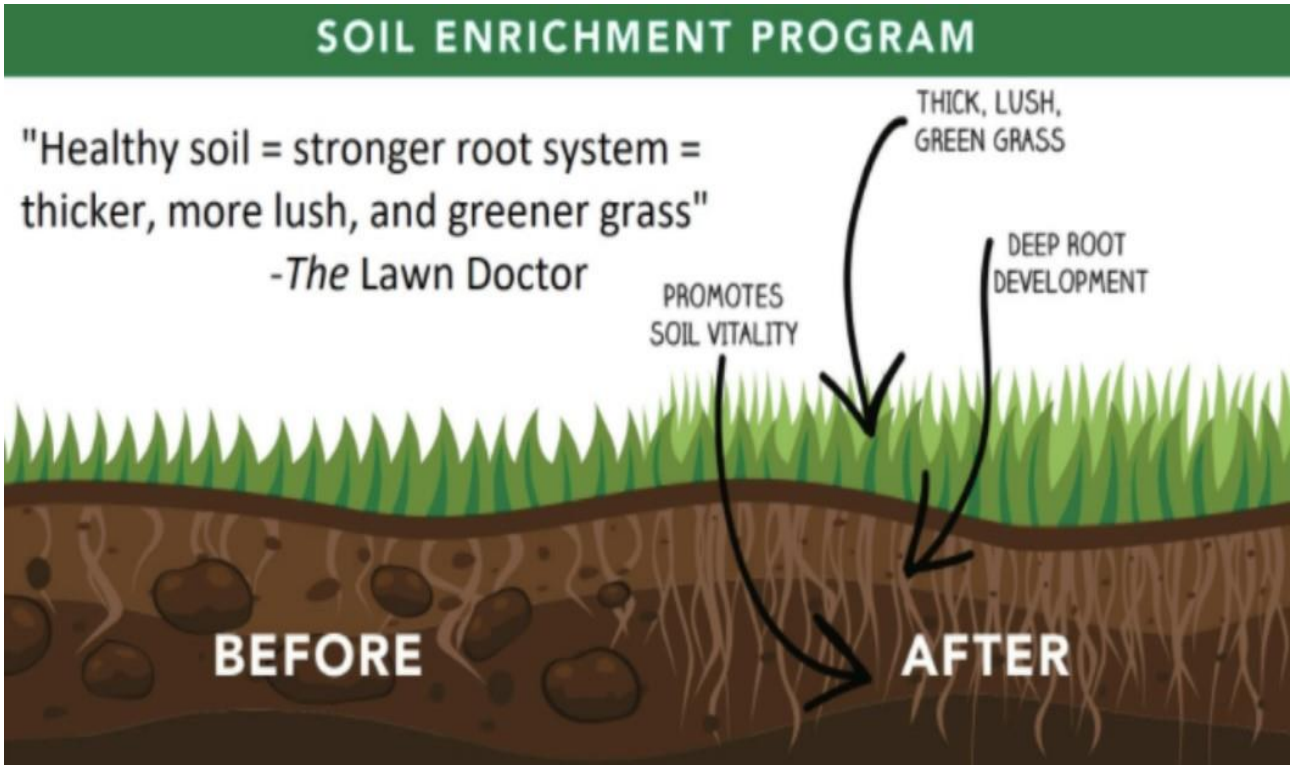


Figure 5ENRICHMENT OF SOIL

PLANTING

The initial step before preparation of the soil is to send the soil to a lab to check whether the soil present in particular land or area is suitable for agriculture or not. The preparation of soil involves three major steps as mentioned below:

1. Ploughing/Tilling the Soil: Ploughing is the first and foremost important step in soil preparation. Ploughing is the process of turning and loosening the soil. It is also called tilling. Ploughing is done using a bull attached to the beam and connected to the wooden or iron plough. Ploughing can be done by tractors too.

Importance of Ploughing

(a) It helps loosen the soil allows roots to penetrate deep into the soil and helps the root in aeration.
(b) Loosened soil helps grow earthworms known as "farmer's friends" and microbes in the soil.
(c) Various nutrients are held in the soil like dead and decayed organisms along with minerals, water and air.
(d) It also uproots and buries weeds standing in the field.

2. Levelling the Soil: The next step is to level the soil after the ploughing. The ploughed field may contain big lumps of soil called **crumbs**. It is necessary to break the soil lumps with a plank or iron leveller. The field is levelled for sowing seed as well as for irrigation purposes.

Fig: Levelling the Soil

Importance of Levelling

(a) To prevent the top fertile soil from being carried away by strong winds or washed away by rainwater.
(b) To help in the uniform distribution of water in the fields during irrigation.
(c) To help prevent the loss of moisture from the soil.
(d) To improve weed control.

3. Manuring Soil: The process of applying manure in agriculture is called manuring. Manuring the soil is very important for plant growth. Sometimes, manures are added to the soil before ploughing. Manures are obtained from organic matter such as dead plant and animal wastes (cow dung, goat waste, etc.)

Fig: Manuring the Soil

Importance of Manuring

(a) Manuring the agricultural land increases soil fertility and crop yield.
(b) Manure upgrades soil texture, recycles nitrogen and introduces essential bacteria.
(c) The proper mixing of manure with soil gives nourishment to the seeds. Manuring is done to restock the soil with nutrients and thus help in the proper growth of the crop.

Precautions while Sowing the Seeds:

There are a few necessary precautions, which need to be followed while sowing the seeds.
Listed below are a few of them.

- The seeds should be disease-free.
- Seeds must be planted at correct distances from each other.
- Seeds should be sown such that all the crops should get an equal amount of light, nutrients, and water.
- Seeds should be sown at correct depths. They should neither be placed at the top of the soil so that it is blown away by wind and animals, nor should it be sown too deep into the soil such that it does not germinate.

Figure 6PLANTING

HOEING

Plant protection is an important part of agriculture to secure high yields and optimal qualities. Due to the increasing world population, both factors play an enormous role in securing food supply. However, the chemical plant protection sector is also facing a big challenge in future. On the one hand there is the problem of resistance and on the other side there is an increasing amount of legal regulation.

The focus is once again on integrated agriculture

The future of plant protection consists of a combination of many different measures. These include the method of cultivation, sowing, choice of variety, crop rotation, catch crops, undersown crops, etc. After harvest, for example, high emphasis is placed on shallow soil tillage in order to maximise the emergence rate for volunteer grain and weeds.

This will also introduce an additional shallow soil tillage step for mechanical weeding between stubble cultivation and primary soil tillage. Primary soil tillage will become more intense and it is possible that ploughs will increasingly be used.

When sowing, optimum sowing conditions and precise seed placement play an important role in promoting seedling development. Under certain conditions, the use of narrower row spacings for a faster canopy closure or targeted under-sowing can play an important role in preventing the growth of weeds.

Another approach is to increase row spacing to allow for mechanical weeding between the rows. Hoeing of grain is a definite trend in organic farming.

Plant breeding will play an important role for plant cultivation in future. Cultivation requires very healthy varieties that have quick seedling development. Consistent yields and the assurance of quality rate higher than achieving absolute maximum yields. The issue of “integrated cultivation”, which has been discussed for many years, is increasingly getting attention.

Figure 7 HOEING

ACCUMALATION

Soil is a natural component of the earth serving a variety of vital functions in our society including food production. With rapid industrialization and urbanization that have occurred in most parts of the world during the last decades, the soil compartment is receiving a substantial amount of pollutants from different sources including heavy metals (Wei and Yang, 2010). A vast count of publications has appeared in the scientific literature documenting metal concentrations in soils of various land uses because of the non-biodegradable nature of these chemical substances and the potential adverse effects on human health. Typical human activities like industrial operations, vehicle exhaust fumes, mining and smelting and atmospheric deposition are known to greatly impact the urban and rural soil environs in terms of heavy metal levels (Aeleen et al., 2008, Chaudhari and Nima, 2013, Cristoforetti and Stamatis, 2009, Douay et al., 2008, Gowda et al., 2010).

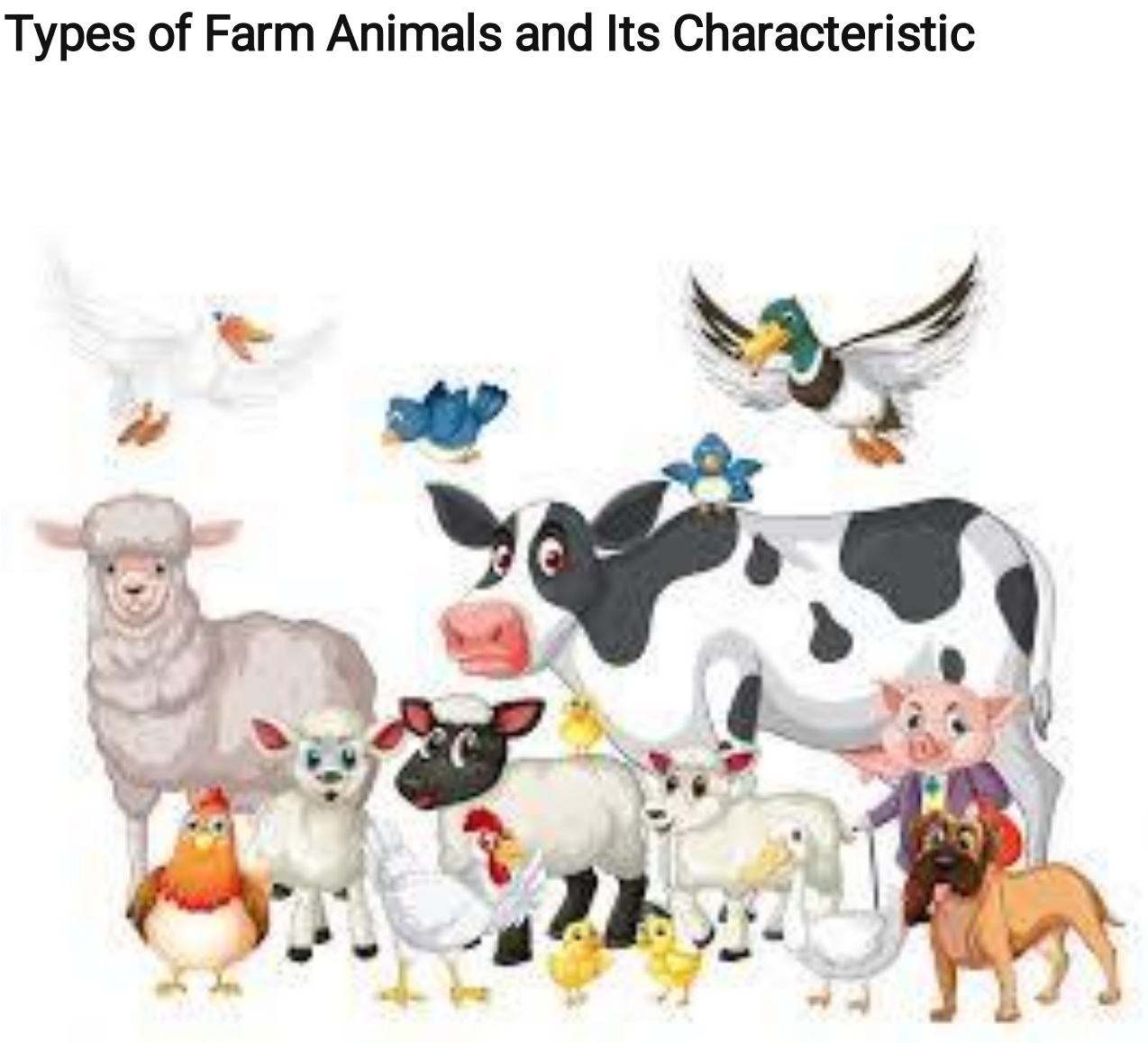
In agricultural soils, the presence of metals is of increasing concern because they have the potential to be accumulated in less soluble forms, transferred into soil solution and subsequently deteriorate the groundwater and crop quality. The food crops constitute an important source of human oral exposure to metals (Harmanes et al., 2011, Zheng et al., 2013), and as a result careful monitoring of metal levels in agricultural soils is of great importance for protecting its quality and ensuring future sustainability (Wong et al., 2002). The natural concentrations of heavy metals in these soils tend to remain low depending on the geological parent material composition (Shan et al., 2013), although significant geogenic enrichment has also been recently reported (Kelepertzis et al., 2013). On the other hand, anthropogenic inputs in agricultural soils that contribute to an increase of the content of some toxic heavy metals have reported including sewage irrigation (Liu et al., 2005), petrochemical activities (Li et al., 2009) and the excessive usage of agrochemicals and manure (Hani and Pazira, 2011, Lu et al., 2012, Nicholson et al., 2003). Although fertilizers are essential for providing adequate nutrients and ensuring successful harvests, long-term repeated application of fertilizers and metal-containing pesticides and fungicides can gradually add potential harmful levels in soils (Jiao et al., 2012). Additionally, because fertilizers tend to be local and ingredient specific, the chemical composition of soils receiving fertilizers inputs is expected to vary according to application rates and source of raw material (Jiao et al., 2012, Nziguheba and Smolders, 2008). Enrichment of soils with Cu, Zn and Cd is the most apparent result characterizing areas that have suffered a long history of intensive agrochemical application (Franco-Uria et al., 2009, Maas et al., 2010, Peris et al., 2008).

China is a country where the heavy metal status of agricultural soils has been extensively investigated during the last decade because of the emerging contamination problems accompanying the rapid urban and peri-urban growth and the establishment of new industrial operations (e.g. Cai et al., 2012, Chen et al., 2008, Huang et al., 2007, Lu et al., 2012, Luo et al., 2012, Niu et al., 2013, Sun et al., 2013). In the Mediterranean area, the majority of the investigations have focused on Spanish agricultural soils (Franco-Uria et al., 2009, Micó et al., 2006, Peris et al., 2008, Rodríguez Martín et al., 2006, Rodríguez Martín et al., 2013) whereas geochemical data also exist for Italy (Abollino et al., 2002, Facchinelli et al., 2001) and Zagreb (Romaic and Romaic, 2003). In Greece, there is an ongoing body of knowledge regarding the agricultural fields in the central part of the country (Antibachi et al., 2012, Golia et al., 2007, Skoda's and Kelepertsis, 2005, Skoda's et al., 2013). However, at present, there are no data about the accumulation of metals in agricultural soils of Peloponnese and in particular of the Argolida basin which exhibits a history of agriculture for more than 50 years. In addition, most studies have conducted at a large scale which may conceal or neglect regional scale information for metal accumulation. For instance, Nanos and Rodríguez Martín, 2012 concluded that anthropogenic heavy metal enrichment in agricultural soils from the Duero river basin (Spain) is masked when considering large spatial scales. Therefore, this study was designed to characterize the accumulation and sources of 10 metals (Cu, Pb, Zn, Ni, Co, Mn, Cd, Cr, As and Fe) in a substantial number of soil-survey plots within the agricultural system of Argolida basin covering an area of approximately 300 km^2. Chemical results for P and K are also included to assist in the source apportionment of metals. Multivariate statistical methods combined with Geographic Information System (GIS) techniques were implemented to identify contamination sources and delineate the areas at hazard of contamination that need a more detailed investigation. Results will be used to provide baseline information for the soil quality status in Mediterranean agricultural soils and support decision makings for ensuring food crop quality and protecting human health.

Figure 8 ACCUMALATION OF PLANTS

TYPES OF FARM ANIMALS

Farm animals are animals that are raised on farms for their meat, dairy products or to help out the farmers. Farm animals are animals that are reared by man for different purposes such as food supply, income generation, clothing materials, etc. Examples include goats, sheep, rabbits, poultry, cattle, pigs, fish, snails, etc.



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materials, etc. Examples include goats, sheep, rabbits, poultry, cattle, pigs, fish, snails, etc.

What are Farm Animals?

Farm animals are animals raised or kept primarily for consumption, to generate income and to help with some farm operations.

Another name for them is Livestock. The difference between farm animals and wild animals is that farm animals live among men while wild animals live in the wild, forest, jungle, etc.

Types of Farm Animals

The following are the 6 main types of farm animals:

1. Work animals

2. Dairy animals

3. Guard animals

1. Work animals

These are animals that are used for work on the farm. They are used for carrying loads, ploughing, harrowing and ridging e.g. cattle, Sokoto Gudia, White Fulani, (in forms of bull and bullock). Such animals are called draught animals. The normal output of a working bull is about 500W compared to that of a man which about 75W.

Work animals are also used for transportation and carrying of load e.g. horses, camels and donkeys. Such animals are referred to as beasts of burden. They have the ability to survive or travel long distance without water.

Characteristics of Work Animals

The following are the characteristics of work animals:

· They are well built with good body conformation.

· They can survive or travel long distance without water.

· They are rugged and have very great strength.

· They have strong hind limbs.

· They are docile and tolerant.

2. Dairy animals

World milk production is almost entirely derived from cattle, buffaloes, goats, sheep and camels. Other less common milk animals are yaks, horses, reindeers and donkeys. The presence and importance of each species varies significantly among regions and countries.

The key elements that determine the dairy species kept are feed, water and climate.

Other factors that may influence the presence of a dairy species are market demand, dietary traditions and the socio-economic characteristics of individual households (e.g., poorer families tend to rely more on small ruminants).

Although cattle are kept in a wide range of environments, other dairy species make dairying possible in adverse environments that often cannot support any other type of agricultural production. Sheep allow milk production in semi-arid regions around the Mediterranean, goats in regions with poor soils in Africa, horses in the steppes of Central Asia, camels in arid lands, buffaloes in wet tropical regions, and yaks in high mountainous areas such as the Tibetan Plateau.

Characteristics of Dairy animals

This indicates that a cow shows evidence of being a good producer. A cow with good dairy character is one who is sharp, particularly at the shoulders and withers, and one who shows no excess flesh or fat.

A long, lean neck showing refinement and not coarseness is desirable.

Thickness at the shoulders, neck, withers or thighs indicates a lack of dairy character.

3. Guard Animals

A variety of guard animals are used all around the world to protect livestock from predators. In Australia, guard dogs (such as maremmas), llamas and alpacas, or donkeys are sometimes used with varying degrees of success. Using guard animals is designed to prevent livestock attacks, but they might not exclude wild dogs from a given area. Livestock guardian dogs are medium to large sized dogs that are kept with livestock to protect them from predators.

Characteristics of Guard Animals

· Territorial – By nature, an excellent guard dog must be possessive of its territory.

· Physically active – A guard dog must be playful and not indolent.

· Loyalty – This is one trait that a good guard dog must possess. The dog must show devotion to its family (which includes other pets as well) and must do anything to protect them.

STORAGE OF CROP

In the case of small-scale cultivation, farmers use the harvested crop for themselves while large-scale production is mainly for marketing. Thus the cultivators have to store the grains. For this, proper storage space has to be arranged. Inadequate storage space and improper storage methods can lead to a huge grain loss.
In addition to pest and rodents, microbes like bacteria, fungi, and environmental conditions such as moisture and temperature might attack the stored grains. Therefore, proper treatment is required before the grains are stored.
Rodent infestations can be prevented by pesticides. A moist environment results in fungal growth on grains. This can be avoided by proper drying of grains in sunlight.
Another method is fumigation where chemicals are used to prevent bacteria and other microorganisms. After proper treatments, grains have to be stored in gunny bags or granaries and deposited in go downs.
Thus we see how harvesting and storage of grains form an important part of crop production.

Definition:

"Storage" means the phase of the post-harvest system during which the products are kept in such a way as to guarantee food security other than during periods of agricultural production.

The main objectives of storage can be summed up as follows:

- at the food level, to permit deferred use (on an annual and multi-annual basis) of the agricultural products harvested;
- at the agricultural level, to ensure availability of seeds for the crop cycles to come;
- at the agro-industrial level, to guarantee regular and continuous supplies of raw materials for processing industries;
- at the marketing level, to balance the supply and demand of agricultural products, thereby stabilizing market prices.

In order to attain these general objectives, it is obviously necessary to adopt measures aimed at preserving the quality and quantity of the stored products over time.

Influences of environmental factors:

To conserve the quality of products over long-term storage, degradation processes must be slowed down or even stopped.

Degradation of grains during storage depends principally on a combination of three factors:

- temperature,
- moisture,
- oxygen content.

During storage, as during other phases of the post-harvest system, the combined effects of these three factors can sometimes cause severe losses.

Temperature and moisture:

Temperature and moisture are determining factors in accelerating or delaying the complex phenomena of the biochemical transformation (especially the "breathing" of the grain) that are at the origin of grain degradation. Furthermore, they have a direct influence on the speed of development of insects and microorganisms (moulds, yeasts and bacteria), and on the premature and unseasonal germination of grain. In the general diagram of conservation designed by Burges and Burrel, the relationship between temperature and moisture content is established in order to determine the area of influence of certain important degradation phenomena, such as: the development of insects and moulds, and the germination of grain. It is easy to observe that the higher the temperature, the lower must be the moisture of the grain in order to ensure good conservation of the products. In view of their influence on the speed of development of these degradation phenomena, the temperature and moisture content of the grain condition the maximal duration of storage.

DURATION OF WAREHOUSING (in days)

	TEMPERATURE					
MOISTURE	**5°C**	**10°C**	**15°C**	**20°C**	**25°C**	**30°C**
13%				180	115	90
14%			160	100	50	30
15%			100	50	30	15
16%		130	50	30	20	8
17%		65	35	22	12	5
18%	130	40	25	17	8	2
19%	70	30	17	12	5	0
20%	45	22	15	8		
21%	30	17	11	7		
22%	23	3	8	6		
23%	17	10	7	5		
24%	13	8	4	4		
25%	10	8	6	3		

As an example, the preceding table shows the recommended durations of warehousing, according to the temperature and moisture content of the grain. The temperature depends not only on climatic conditions but also on the biochemical changes that are produced inside a grain mass, provoking undesirable natural heating of the stored products. As for the moisture content of the stored grain, it depends on the relative humidity of the air, as shown in the air-grain equilibrium curves. With a relative air humidity below 65-70 percent, many grain-degradation phenomena are slowed down, if not completely blocked. In this sense, the "safeguard" moisture content is defined as that corresponding to an equilibrium with the air at 65-70 percent relative humidity.

The following table shows the moisture content recommended for long-term storage in hot regions of various sorts of grain.

GRAIN	**MOISTURE**	**GRAIN**	**MOISTURE**
Paddy	14.0%	Sunflower	9.0%
Rice	13.0%	Wheat	13.0%
Maize	13.0%	Millet	16.0%

Sorghum	12.5 %	Coffee	13.0%
Beans	15.0%	Cocoa	7.0%
Groundnut	7.0 %	Copra	7.0 %

The major causes of loss in the store are insects, rodents and dampness. Insects and rodents live on the farm produce and damage it. In the process of causing damage to this produce, they may contaminate and reduce the quality, and therefore, the value of the produce. The insects can destroy the germinating power of stored products, and during the process of breathing and interacting with produce, damp patches in a heap of farm produce, which result to the formation of moulds which can destroy the produce. Damp patches in stored produce will cause direct damage and can also cause the containers to rot.

Fig.8: Storage of Crop

MARKETING

Agricultural marketing is a method that includes gathering, storage, preparation, shipping, and delivery of different farming materials across the country. In agriculture marketing, the selling of an agriculture product depends on various components like the demand for the product at that time, availability of storage, etc.

Before Independence, farmers while selling their products to traders experienced massive incorrect weighing and manipulation of accounts. The farmers did not have required information about the prices and were forced to sell at low prices with no proper storage facility.

Sometimes, the product could be sold at a weekly village market in the farmer's village or in a neighbouring village. If these shops are not available, then the product is sold at irregular markets in a nearby village or town, or in the mandi. So, the government took various measures to control the activities of the traders.

The four Government Measures to Improve Agriculture Marketing

- The initial step was to regulate the market and plan a clean, transparent and simple marketing strategy. This regulation helped both the farmers and the consumer. But it still needs to realize the full potential of rural markets.
- The second measure was the procurement process like transportation facilities, warehouse, cold storage, go-downs, and the processing unit. However, the current infrastructure is inadequate to adhere to the growing demand and therefore needs to be improved.
- The third aspect is to decide on the fair price for the product. In the past, it has been a set back due to the unequal coverage of farmer members and the absence of a suitable link between marketing, processing cooperatives, and inefficient financial management. Example of a successful cooperative is the Gujarat milk co-operative which transformed the social and economic landscape of Gujarat.
- The last one is policies such as.
    1. Guarantee of Minimum Support Prices (MSP) for agricultural products
    2. Storage of surplus stocks of wheat and rice by Food Corporation of India (FCI)
    3. Distribution of food staples and sugar through PDS

All these measures were penned down to guard the income of the farmers and procuring agriculture products in the subsidized rate to the underprivileged. However, in spite of government interference in agriculture marketing, private traders still dominate the agricultural markets. Efforts to develop agricultural marketing have, particularly in developing countries, intended to concentrate on a number of areas, specifically infrastructure development; information provision; training of farmers and traders in marketing and post-harvest issues; and support to the development of an appropriate policy environment.

In the past, efforts were made to develop government-run marketing bodies but these have tended to become less prominent over the years. Retail marketing systems in western countries have broadly evolved from traditional street markets through to the modern hypermarket or out-of-town shopping center. In developing countries, there remains scope to improve agricultural marketing by constructing new retail markets, despite the growth of supermarkets, although municipalities often view markets primarily as sources of revenue rather than infrastructure requiring development.

Effective regulation of markets is essential. Inside a market, both hygiene rules and revenue collection activities have to be enforced. Of equal importance, however, is the maintenance of order outside the market.

Licensed traders in a market will not be willing to cooperate in raising standards if they face competition from unlicensed operators outside who do not pay any of the costs involved in providing a proper service.

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Fig.9: Marketing

CHALLENGES OF FARMERS

Like many other sectors, the agricultural landscape also faces decades-long problems and unexpected challenges that are crucial to rectify. Let's discuss some of the main issues farmers face in India and the best possible solutions.

Main Problems often faced by Indian Farmers:

1. Insufficient Water Supply:

Water availability in India is more than sufficient to irrigate all cultivation areas; the problem is that we still have to find cheap and suitable solutions to utilise such enormous water supplies. Due to several reasons, farmers either don't receive the appropriate amount of water or don't get the supply on time; many farmers rely on rainwater for irrigation.

2. Less Use of Modern Farming Equipment:

In most areas, to date, farmers follow primitive cultivation methods; traditionally-used plough and relevant native accessories continue to be farmers' preference. Despite no shortage of efficient equipment and machinery, there's very little use of modern equipment, majorly because most farmers don't have lands huge enough to use advanced instruments, heavy machinery.

3.Over Dependence on Traditional Crops:

Indian farmers are growing rice and wheat for centuries now in several regions. The excessive production of the two grains, many times lead to the storage, sale problems and shortage of other farm products.

"India is heading toward a fourth record wheat harvest and near-record rice production for 2020-21" – the US Department of Agriculture. Many farmers depending upon only these traditional crops indicates a lack of an effective, nation-wide agriculture plan.

4. *Poor Storage Facilities:*

In rural areas, storage facilities are either insufficient or completely absent. In such a situation, farmers usually have no other option than selling their produce immediately once it's ready, at market prices that are often very low. They are far away from a legitimate income.

5. Transportation Problems:

Lack of cheap, efficient means of transportation is a big problem widely seen in the Indian agriculture sector; small farmers still rely on bullock-carts for transporting their produce. Moreover, lakhs of villages are connected with highways and market centres with temporary (kutcha) roads that become muddy and useless in rains. Consequently, farmers cannot deliver their produce to the central market and helplessly sell it in the local market at low costs.

6.High Interest Rates:

Thousands of farmers take their lives each year due to debt burden (having other indirect causes interlinked). Unreasonably-high interest rates should be declared illegal, and the government must take quick, strict, and appropriate action against greedy money lenders. Another problem is small and marginal farmers have to go through cumbersome procedures (that they are unaware of) to get institutional credit.

*7.*Government Schemes are yet to reach Small Farmers:

In 2008, the government brought agricultural debt-waiver and debt-relief scheme in effect to benefit over 36 million farmers. The scheme also covered direct agricultural loan to stressed farmers. However, most of such welfare programs and subsidies announced by both the central and state governments are yet to reach poor farmers, while big/wealthy landlords are hugely benefited.

SUGGESTIONS TO FARMERS

1. Multiple Crops:

For better yield and profitable results, farmers are advised to cultivate multiple crops, including and many others.

2. Modernisation in Agriculture:

If we encourage youth for farming and related occupation, this sector will definitely boom. They already have basic institutional education and knowledge; they can learn and grow quickly. For instance, almost all of them have smartphones; by using a modern agriculture app, they can perform well in farms.
Besides, introducing modern technology and passing advanced equipment to small farmers will help boost efficiency, productivity, and quality.

3. Farmers' Education is Vital:

Many farmers are unaware of crop rotation. Education is pretty much improved in urban areas, but the govt has overlooked the need for the same in rural areas, particularly in the overall agriculture sector. This is the reason why farmers remain unaware of several government-provided schemes and their benefits.

4. The Requirement for Crop Insurance:

Crop insurance is essential but easy, quick settlement of claims is vital. There's a need for transparent index-based insurance that treats policyholders equally within a defined geographical area. Index-based insurance system has low operational and transnational costs and ensures quicker payouts.

5. Better Water Management:

Water resources can be fully utilised through interstate coordination on water management; water can easily be delivered to the areas where it is most required. Connecting the rivers and constructing national waterways/channels will solve water supply problems and improve irrigation facility, helping farmers in case monsoon fails.

6.Insufficient Income:

Farmers don't get sufficient income due to the mediators, because farmers don't interact with consumers directly. I suggest farmers to have a fixed and profitable price for the required crop.

CONCLUSION

The world is constantly changing, moving forward at a rapid paced, leaving the ways of the past behind. The agriculture industry is being left in the dust, while machines and technology take over the ways of the world. Being over shadowed by the new ways of life is having a negative impact on the agriculture industry. Urbanization is pushed out land, factories are compromising the quality of soil, and the working labor pool is getting smaller and smaller.

While all these negative things are happening, it's not too late to combat the issues. So far we can reduce the loss of land by setting policies and implementing it as gardens in cites. We can set regulations on dumping and engineer new breeds of tolerant plant crops. We can put in place laws that benefit those workers who are willing to pursue a career in the industry. These are just some of the ways we can combat these issues. As we keep advancing, we can advance new ways to fix all these problems, but we have to do it fast. The agriculture industry is one that needs to be preserved in order to sustain life. Without agriculture there would be no food, and without food there would be nothing.

At the turn of the twenty-first century there were three family members for every full-time worker on English farms. Certain sectors of farming, however, particularly horticultural production, still rely heavily on seasonal and casual labors. This workforce traditionally was made up of local women and children, but since the late twentieth century the vast majority of casual workers have been migrants recruited from Eastern Europe and beyond. This concluding chapter asks why this change occurred, and what it reveals about the nature of farm work today. Intensification of production systems, the Seasonal Agricultural Workers Scheme, the rise of the modern gang system and the implementation of the Gang masters Licensing Act of 2004 are all explored. The main themes of this book are drawn together

In order to address the main constraints affecting the development of the national and regional seed supplies that are mentioned here, the region requires integrated efforts by all national and international stakeholders and institutions involved in seed supply and plant genetic resource management. On practical issues, lessons learned by some countries could be shared with other countries; e.g. on how to progress with the transition or how to recognize the most immediate needs of farmers. Appropriate policies should also be established, at various levels, in order to facilitate seed investment and development in the region. The world is constantly changing, moving forward at a rapid paced, leaving the ways of the past behind. The agriculture industry is being left in the dust, while machines and technology take over the ways of the world. Being over shadowed by the new ways of life is having a negative impact on the agriculture industry. Urbanization is pushed out land, factories are compromising the quality of soil, and the working labour pool is getting smaller and smaller. While all these negative things are happening, it's not too late to combat the issues. So far we can reduce the loss of land by setting policies and implementing it as gardens in cites. We can set regulations on dumping and engineer new breeds of tolerant plant crops. We can put in place laws that benefit those workers who are willing to pursue a career in the industry. These are just some of the ways we can combat these issues. As we keep advancing, we can advance new ways to fix all these problems, but we have to do it fast. The agriculture industry is one that needs to be preserved in order to sustain life. Without agriculture there would be no food, and without food there would be nothing.

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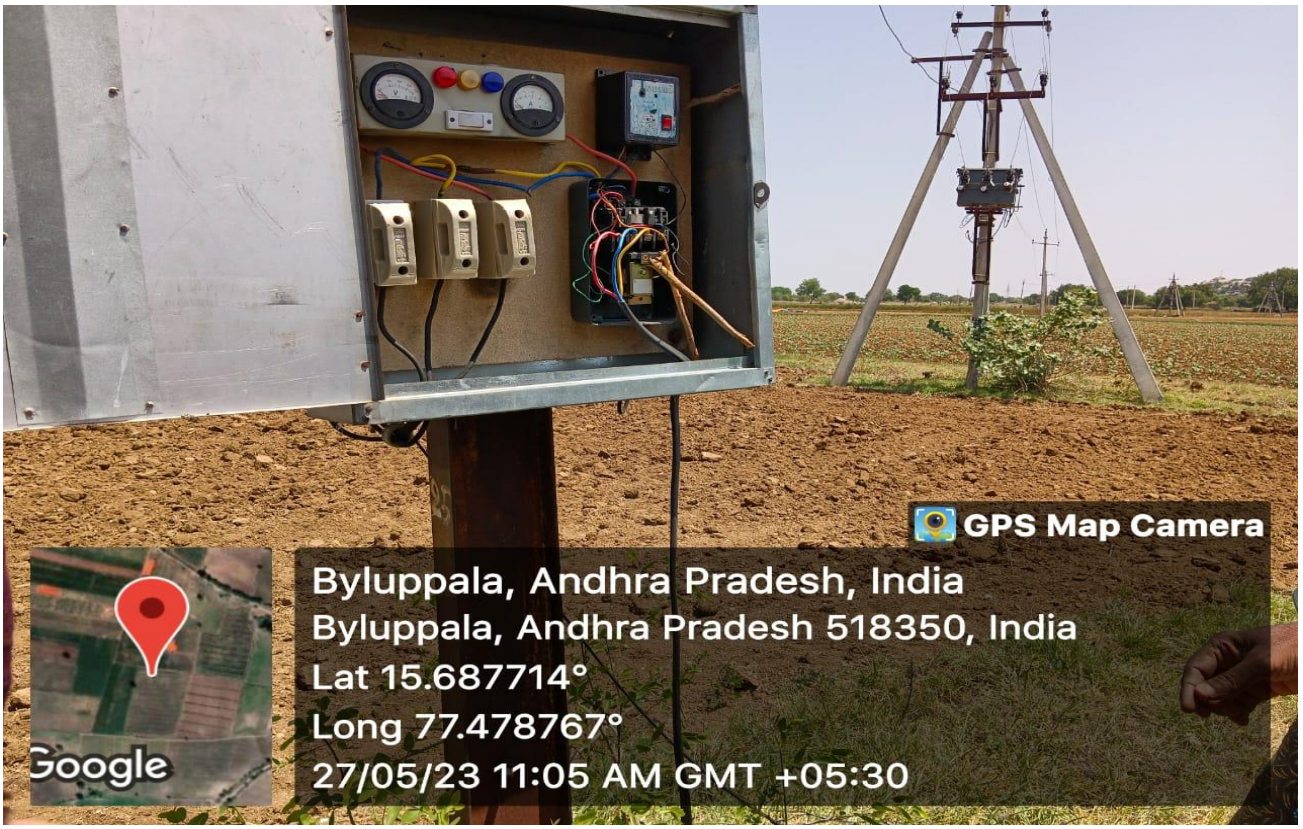
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