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A Review on Environmental Impact Due to Technological Advancement in Agriculture

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ABSTRACT- Agriculture is one of India's most vital sectors, and it is critical for the country's economic survival and prosperity. Agriculture is the source of livelihood for around 70% of households and 10% of the urban population. Today, India is the world's top exporter of agricultural goods such as the coffee, rice, tea, vegetables, etc. as well as their preparation and marine products. The Agricultural Researching Systems in the India pinnacle of process that began the nineteenth century and culminated in the formation of Indian Councils of Agricultural Research (ICAR) in 1929 recommendation of Royal Commissions on the Agriculture. The present researching systems, the ICAR primarily assists, promotes, and collaborates on research and education in India at the national level. Because farmers strive to feed globe with the limit naturally resourcing, technologically advancement are the critically to futures of farming. The agri-tech solution contributes to the overall expansion of sustainable agriculture and food production. Agri-tech startups and disruptive market newcomers are the focus of the funding. Agriculture output increases as a result of new technology, resource input, and economic incentives. Future food-production and handling technological development should be non-polluting, decrease environmental and health risks, and not inspire additional governmental restrictions.

KEYWORDS- Agriculture, Economic, Environment, Innovation, Sustainable.

I. INTRODUCTION

Agricultural the most common land the use on planet. Agricultural India's economic powerhouse, and it plays a critical part in the country's social and economic domains. The four key sustainability criteria for agricultural production. The greatest problem in today's environment, providing an adequate the diet supply for the global population. Agriculture's environment impacts (Figure 1) in diverse agricultural practices on ecosystems and how that effect may be linked back to the agriculture practice. Agriculturing's environmental effect varies widely depending on the farmer's methods and the scope of such practices. Sustainable-Agriculture techniques are agri-practices that try to reduce environmental effect by changing the practice [1-5].

Natural resource scarcity, climate change, and food waste are the primary trends putting strain on the agriculture model's ability to meet future demands. All of these factors are exacerbating the problem of hunger and food shortage. Experts employ two sorts of indicators when assessing the environmental impact: technique, which influence of the farming methods the agricultural systems. The superiority groundwater that impacted by amount nitrogen in soil is an example of a mean-based approach. The indicators used to determine Nitrate damage to groundwater are "effects-based." The farmer's agriculture practice is examined in a means-based evaluation, whereas the actual effect of agricultural practice is examined in an effects-based assessment. Farmers employ a "mean-based" pesticide and fertilizer analysis technique, while "effect-based" evaluation examines how much carbon dioxide is emitted and how much nitrogen is present in the soil [6-10].

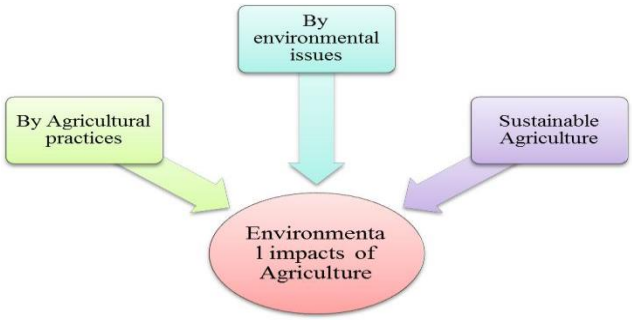

Figure 1: Illustrates the environmental impacts of Agriculture in Different Farming Practices that on the Ecosystem

Agriculture's environmental effect includes a range of factors such as plant, and humans. Agriculturists contribute to a slew of environmental issues, including climate changes, irrigations, genetic engineering, soil pollution, & wastes. The sustainable agricultures the notion that the agriculture should be conducted in such a manner that we can continue to produce what is necessary without jeopardizing future generations' capacity to do so. In recent decades, rapid population growth has boosted agricultural land conversions to meet food demands, which has had a bad impact for the environment. Agriculture has the potential to have a negative influence on biodiversity. The organic farming is a multi-faceted, long-term agricultural technique that has the least environmental impact on a small scale. In terms of

production/unit/area, organic farming produces less. To achieve the same level of production, organic farming requires more land to be cleared and water resources to be withdrawn. Governments, investors, and novel agriculture technology will need to work together to tackle all of the problems [4,11].

II. LITERATURE REVIEW

J. Pretty expressed concerns regarding the need to create technologies and methods which do not impair ecological services, were available to & effective for growers, and increase food output is at the heart of agricultural system sustainability. It would be overly optimistic to assume that these relationships will remain linear in the future, despite significant gains in agricultural productivity over the last half-century, with increased use of fertilizers, irrigation water, agricultural machinery, pesticides, and land driving crop and livestock productivity. Fresh interventions are necessary that incorporate biota procedures into agricultural production, reduce the use of non-renewable inputs which damage the environment or the wellness of producers & consumer, make productive use of farmer knowledge and skills, thus replacing expensive inputs with human capital, and regularly active use of people's strong team. Sustainable agriculture may enhance food yield, pesticide usage, and carbon balances [12].

N. Schaller discussed sustainable agriculture has become a buzzword for agricultural practices that are ecologically friendly, productive, commercially viable, and socially desired. This study addresses the suggested objectives and means of agricultural sustainability, as well as two hotly contested topics: the economics of the sustainable farming and adequacies of the food supply from the sustainable system. Idea of the agricultural the sustainability is difficult to define precisely, partially because it encompasses both a style of thinking and a set of farming methods that cannot be stated as definitive answers. As a result, public perception of the notion will continue to be shaped by people's views and values. Furthermore, resource conservation, environmental preservation, and farming in collaboration with nature all of which are prerequisites for sustainability will increase rather than decrease the globally foods productions. The other concern, such as links between the sustainable agriculture & rest of food & fibers systems, as well as consequences of the sustainability for the rural community and the society as whole [13].

D. Rigby et al. showed that although everyone wants a sustainable agriculture, consensus on how to get there is difficult to come by. The notion of sustainable agriculture is explored to see if it has any practical application. Organic farming, a rapidly developing sector in many nations, is examined in terms of sustainability. In this debate on sustainability, the role of regulation and the use of synthetic agrochemicals, the desired level of self-reliance of agricultural systems, and the size of production and trade in agricultural commodities are all discussed [14].

A. Papageorgiou discussed the increased competitiveness has resulted from the liberalization of international commerce as a result of the removal of market barriers between nations within the context of economic unions such as the European Union (EU), as well as the growth of globalization. State competitiveness is defined by the European Commission as a continual growth in a nation's or region's standard of living, a concept that blends competitiveness with sustainability and social aims. Although one of the EU integration goals is for a nation's quality of living to grow steadily, this appears to be an issue in Greece. The adoption of the Common Agricultural Policy found the country's agriculture unprepared and inadequate to confront changing market circumstances over the long run. The Greek economic crisis might be viewed as a chance to completely rethink the country's growth plan. In terms of the agricultural sector, this reestablishment may be based on the principles of sustainability, with due regard for the region's economic, social, and environmental features [15].

III. INNOVATIONS IN AGRICULTURE

Since, farmers are attempting to feed the entire globe productivity will rise as a result of new technology, resource input, and economic incentives. Future technology advancements in activities must be the nonpolluting, decrease environment risks, and not to inspire additional regulatory controls. Study's main focus is on resource innovation in terms of land, water, and energy, with the goal of increasing effectiveness and yield. Figure 2 depicts the five ag-tech startup solutions that can help the world's sustainable agriculture and food handling development:

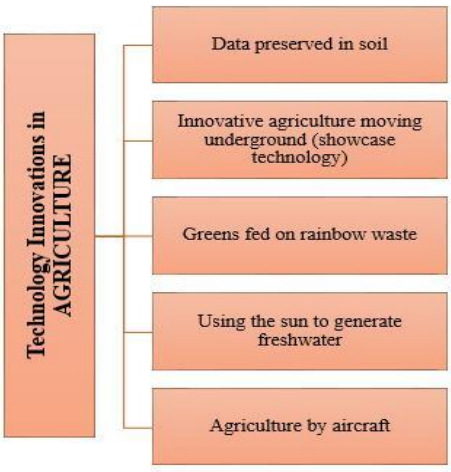

Figure 2: Illustrates the Technological Advancement and Innovation in Agriculture

A. Data that has been preserved in soil

Basic needs of the traditional agriculture model the availability & suitability of the land. By combining new analyses, field experiments, statistics, and crowd-sourcing, African Soil Information Services (AFSIS) developing soil map. The key to planning sustainable agricultural growth and natural resource management is innovative farming ideas like digital soil mapping. All of these maps are freely available to be examined on Google Earth.

B. Innovative underground agriculture

Compared to regular agriculture, subterranean agriculture has a lot of advantages. By being within a big metropolis, farmers can supply fresh food to a huge metropolitan market. They don't have any pest, so that they have use pesticide, & the weather is an issue. The application of technology in agriculture promotes development and expansion through active manufacturing processes. Hydroponics-based cultivation progresses at double the rate of traditional cultivation. A special LED lighting gadget is utilized in this procedure to speed up the photosynthesis process.

C. Green waste rainbow feds

Embracing morals circles of the interchanges common agricultural innovation. Hydroponics is a method of growing plants that employs mineral-enriched water. In an aquaponics recirculating system, fish farming and plant growing are combined. Fish provides virtually all of plant nutrition in the form aquaculture sewages, is separated from fish waste metabolites by direct absorption and nitrification by plants in suitably maintained water, and then returned to the fish.

D. Solar-energy generation of fresh water

The major trend in agriculture is to improve water efficiency in farming and food production. The argument is that despite the fact that water covers 71% of our globe, there is still a scarcity of water. Sundrop Farms is one of the agricultural inventions that makes use of a rare renewable resource that is abundant in comparison to seawater: sunshine. Sundrop Farm collects solar energy to provide energy for purifying and hydroponics greenhouse supplies. When compared to traditional greenhouse production, sundrop farms lessen reliance on scarce natural resources.

E. Airborne agriculture

The agricultural business is increasingly reliant on aircraft. Crop dusting, fertilizer spraying, pesticide distribution, topdressing, and hydro-seeding are all common uses for agriculture aircraft. In the agricultural industry, crops dusting's is called as an aerial applications, and it is one of key to the current efficiencies in the agricultural. Such aircrafts must improve their efficiency, cost-effectiveness, environmental compatibility, and safety. Traditional fuels and tube wing designs are the only options for aircraft design.

IV. DISCUSSION

Innovation is a key driver of social and economic development, particularly environmentally responsible innovation that boosts output and makes better use of the natural resource. The world's economic, political, & environment conditions change, innovations is currently supporting higher value in an organic raw materials in series processing, packing, storages, transportation, and distributions of the food after the productions and the food safety. As a result, equipment in the farming accelerates the growths & developments by allowing for effectiveness production through a defined procedure. Over time, the application of technology and creativity may have resulted in a reduction in poverty in rural areas. A conceptual framework for modernization, primarily for the utilization of machinery, must be created. In terms of scope, farmers must be clearly understand how the growth is & implementation inventions will be allows for prospective agricultural effects. The objective of R&D should not restricted a specific percentages of the budget allocation. It is the should be recognized science's contributions to society is one of the most important foundations for sustaining agricultural output.

Increasing agricultural production, boosting farmer income, reducing poverty, and expanding rural areas are not insurmountable aims. Growth in income among small farmers & corporates enterprises, also in agriculture sector and foods chain, would result in a large increase in social benefit in the country. To improve efficiency and reduce poverty in rural regions, comprehensive and inclusive research and strategies are needed. Taking action has become authoritative in light of the very well organized utilization of the natural resources, foods security, and effects climate changes. Various technical developments, including will need farm houses and agricultural operations to be handled in a completely different manner. Moisture, robotics, Ariel pictures, temperature sensors, and GPS technology will all be used in future farming. These gadgets and robotic structures will make farming more environmentally friendly, cost-effective, efficient, and secure.

High-tech agricultural output is a way to meet the growing population's food demands. To meet all of the demands of a rapidly expanding population, agricultural productivity must increase by 70% in making levels and improve proficiently in harvesting, marketing, and resource intake. Various inventions in the field of information and communication technology that can benefit the agricultural sector in the fields of precision agriculture, farm management software, wireless sensor technologies, and agriculture equipment technology. Precision agriculture makes extensive use of remote detection machinery. The article examines how precision agriculture is changing agricultural practices through the use of aerial vehicles for imaging, handling, and inspection. Because farmers are attempting to feed the whole globe with limited natural resources, technological innovation is critical to the future of agriculture.

Agriculture production will increase as a consequence of new technology, source effort, and financial inducements. Future high-tech improvements in food processing and other activities should be non-polluting, reduce environmental risks, and not be accompanied by additional regulatory forms. The significance of this research is the invention of new land, energy, and water sources that increase efficiency and productivity. To meet all of the demands of a rapidly expanding population, agricultural productivity must increase by 70% in making levels and improve proficiently in harvesting, marketing, and resource intake Various inventions in the field of information and communication technology that can benefit the agricultural sector in the fields of precision agriculture, farm management software, wireless sensor technologies, and agriculture equipment technology. Precision agriculture makes extensive use of remote detection machinery. Agricultural development has been shaped considerably by technological advancements over time. Humans have discovered a new technique to make

agriculture more effective and generate more food by developing a tool to Global-Positioning-System (GPS) centered on precision-farming gear. A technological revolt in farming is being steered by advances in robotics and detection technologies, which appear to be on the verge of disrupting current methods. Automation and robotics, vertical indoor farming, livestock technology, precision agriculture, up-to-date greenhouse practice, artificial intelligence, and block-chain are all examples of major technical advancement in space.

V. CONCLUSION

In contemporary agricultural techniques, innovations are more important than ever. The agriculture business is facing significant difficulties, including workforce scarcity, growing supply prices, and shifting customer preferences for transparency and sustainability. Cultivation businesses are increasingly aware that a solution is required to address these issues. The advantages of indoor-vertical-farming are numerous, ranging from sustainable urban-growth to capitalizing on agricultural output with low employment expenses. Vertical farming can control factors like humidity, light, and water to properly measure year-round, resulting in consistent food production. Farm robotics, often known as "smart farming," is a type of technology that helps farms become more efficient and computerize the crop/livestock production cycle. Drones, self-driving tractors, automated watering, robotic harvesters, and seeding robots are all being developed by a growing number of firms. Industry is currently experiencing unprecedented growth, thanks in large part to remarkable recent technological advancements. Today's greenhouses are large-scale, capital-infused, and urban-focused. The idea is for the farmer to use artificial intelligence to attain his or her aims of a higher crop by making better field decisions.

REFERENCES

[1] Saxena NN, Pradesh U. Treatment for Tomato Harvest utilizing Matric Suction Irrigation. 2021;10(1):819–23.

[2] Gautam N, Gautam N. Seed Coating with Beneficial Microbes for Precision Farming. 2021;10(1):813–8.

[3] Gupta MM, Jankie S, Pancholi SS, Talukdar D, Sahu PK, Sa B. Asynchronous environment assessment: A pertinent option for medical and allied health profession education during the covid-19 pandemic. Educ Sci. 2020 Dec 1;10(12):1–14.

[4] Khan G, Dwivedi R kumar. Autonomous deployment and adjustment of nodes in UWSN to achieve blanket coverage (ADAN-BC). Int J Inf Technol. 2020 Dec 1;12(4):1195–204.

[5] Tyagi S, Dwivedi RK, Saxena AK. A novel PDF steganography optimized using segmentation technique. Int J Inf Technol. 2020 Dec 1;12(4):1227–35.

[6] Rai DV, Kumar G. Soul and mind as quantum states of an embedded human system. Int J Sci Technol Res. 2020 Jan 1;9(1):550–8.

[7] Sharma TK, Rajpurohit J, Prakash D. Enhanced Local Search in Shuffled Frog Leaping Algorithm. Adv Intell Syst Comput. 2020;1053:1441–8.

[8] Sharma S, Bansal M. Real-time sentiment analysis towards machine learning. Int J Sci Technol Res. 2020 Feb 1;9(2):987–9.

[9] Hirawat A, Taterh S, Sharma TK. A dynamic window-size based segmentation technique to detect driver entry and exit from a car. J King Saud Univ - Comput Inf Sci. 2021;

[10] Sharma TK. Enhanced butterfly optimization algorithm for reliability optimization problems. J Ambient Intell Humaniz Comput. 2021 Jul 1;12(7):7595–619.

[11] Kumar DP. AN INVESTIGATION ON AGRICULTURE IN INDIA. Int J Mod Agric [Internet]. 2021 Mar 18 [cited 2021 Dec 20];10(1):585–9. Available from: http://www.modern-journals.com/index.php/ijma/article/view/631

[12] Pretty J. Agricultural sustainability: Concepts, principles and evidence. Philosophical Transactions of the Royal Society B: Biological Sciences. 2008.

[13] Schaller N. Sustainable agriculture and the environment: The concept of agricultural sustainability. Agric Ecosyst Environ. 1993;

[14] Rigby D, Cáceres D. Organic farming and the sustainability of agricultural systems. Agric Syst. 2001;

[15] Papageorgiou A. Sustainable development as a solution to agricultural competitiveness: The case of Greece in the era of European integration. J Cent Eur Agric. 2012;