

Vol.4 Issue.09 Sept, 2024

1. Periodontal Disorders and its Management in Small Animals

Mehra et al [Download](#)

2. Environmental Degradation and the Use of Technology in the Agricultural Sector

Shrivastav and Ahmad [Download](#)

3. Thermal pollution

Sravanthi et al [Download](#)

4. Biochar for Climate Change Mitigation: Turning Carbon into a Climate Solution

Sravanthi et al [Download](#)

5. Eco-Watchers Underground: The Role of Earthworms in Toxicology

Shivhare et al [Download](#)

6. Porcine Reproductive and Respiratory Syndrome

Shivhare et al [Download](#)

7. Climate change and its impact on marine life

Khushbu and Sheoran [Download](#)

8. Kyasanur Forest disease (KFD) in India

Khushbu and Baruah [Download](#)

9. Impact of antibiotic use on gut microbiome

Khushbu and Baruah [Download](#)

10. High-Performance Liquid Chromatography and Its Uses in Detecting Residues in Food

Khushbu and Soni [Download](#)

11. Scope of DNA Barcoding in Livestock Improvement

Singhal et al [Download](#)

12. Water pollution: A threat to aquatic life and ecosystem

Harini et al [Download](#)

13. Periodontal Disorders and its Management in Small Animals

Mehra et al [Download](#)

14. The Power of Molecular Microbiology: A Game-Changer for Sustainable Agriculture

Saharan and Mehta [Download](#)

15. Therapeutic Management of Degnala Disease in Buffalo

Meena and Meena [Download](#)

16. Drug Discovery for Parasitic Diseases: Powered by Advanced Technology and Enabled Pharmacology

Kukashwal *et al* [Download](#)

17. Successful Clinical Management of Hydrallantois in A Ongole Cow

Mohan and Priyanka [Download](#)

18. Mycotoxins in Aquafeeds

Kharabe *et al* [Download](#)

19. "Feline Scabies": An external parasitic skin disease in cats (Gujrati)

Raisiya *et al* [Download](#)

20. The Art and Science of Dry Flower Production

Chandana *et al* [Download](#)

21. Take special care of animals in hot weather

Dr. Deepak Kumar Chaurasia [Download](#)

22. Common Viral Diseases Encountered in Captive Asian Elephants

Rajasathiya *et al* [Download](#)

23. Rupture of prolapsed uterus: its successful management in a cow

DK Chaurasia and D. Sarkar [Download](#)

24. Mushroom Cultivation: A Sustainable Solution for Nutritional Security and Rural Livelihood

Shahi *et al* [Download](#)

25. Water Pollution - An Indirect Invitation to Disaster

Sumitra *et al* [Download](#)

26. Potential uses of grain amaranth Improved varieties, agro-techniques, increase the yield and area in India and enhance the availability of nutritious food in human beings

Raiger and Jajoriya [Download](#)

27. Early Detection of Canine Cancer: What Every Dog Owner Should Know

Shikha Sharma [Download](#)

28. The Role of Artificial Intelligence in Veterinary Medicine

Dutta *et al* [Download](#)

29. Standard operating procedure to be followed during brucella vaccination

meel et al [Download](#)

30. Leechi Disease: A Growing Threat to Poultry Farmers

Rinku et al [Download](#)

31. Scope Of DNA Barcoding in Livestock Improvement

Singhal et al [Download](#)

32. Forensic Entomology

Kranthi et al [Download](#)

33. Factors Affecting Quality of Pellet and Feed Mill Efficiency

Manju Lata [Download](#)

34. Methods of Testing Developmental Toxicity in Female Rats: A Comprehensive Fetal Evaluation Approach

Manju Lata [Download](#)

35. Rethinking Nanomedicine: The Promise of Biodegradable Nanoparticles

Surjith et al [Download](#)

36. Pregnancy Toxaemia in Goats: A Review

Chandu et al [Download](#)

37. Assessing Genotoxicity: Insights from the Mammalian Erythrocyte Micronucleus Assay in Rats

Bindu Shree et al [Download](#)

37. Assessing Genotoxicity: Insights from the Mammalian Erythrocyte Micronucleus Assay in Rats

Bindu Shree et al [Download](#)

38. Integrated Approach for Mosquito Control

Manaswini Dehuri [Download](#)

39. Coconut Farmers Trained to Operate Tree Climbing Machines

Kumar et al [Download](#)

40. Canine demodicosis: An update

Kanwar et al [Download](#)

41. Importance of Animal Welfare in Aquaculture: Health, Environment, and Sustainability

Srishti Manna [Download](#)

42. Importance of Animal Welfare in Aquaculture: Health, Environment, and Sustainability

Srishti Manna [Download](#)

43. Nano plastics: The new frontier of pollution

Surjith et al [Download](#)

44. Review on Canine Demodicosis

Chandu et al [Download](#)

45. Physiological Approaches for Boosting Productivity in Dairy Cattle

Chawla et al [Download](#)

46. Cryptosporidiosis: A Zoonotic Threat to Veterinary Professionals

Vishav Bharti [Download](#)

47. Alternative measures to address antibiotic resistance

Monali and Kumar [Download](#)

48. Predictive Pathology: Leveraging AI for Prognosis and Personalized Veterinary Care – An Introduction

Saahithya et al [Download](#)

49. Impact of Climate Change and Land Use on Urban Flooding: Insights from Hydrological Modelling

Murali and Srinivasan [Download](#)

50. Tree - Crop - Soil interaction in Agroforestry system

Rathod et al [Download](#)

51. Alternative measures to address antibiotic resistance

Sonali and Kumar [Download](#)

52. Bovine Babesiosis: A potential threat to cattle health

Kumari et al [Download](#)

53. Health benefits of Millets

Aarti and Anisha [Download](#)

54. Clinical and Nutritional Importance of retinol (Vitamin A) in the domestic and companion Animals

Kumar et al [Download](#)

55. De-Extinction – Reviving the Vanished Animals

R selvam [Download](#)

56. The Impact of RED Biotechnology on Healthcare Advances

Pande et al [Download](#)

57. Faecal Sample Examination techniques: Qualitative methods

Nath et al [Download](#)

58. phasaatageshan dvaara igavaanee savaka, bhagavan jal kee praapti

Singh et al [Download](#)

59. Genome Editing: A Novel Tool for Disease Resistance

Sharma and Babli [Download](#)

60. Sous Vide: A Novel Culinary Technique to Cook a Healthy Food

Ghorai and Sharma [Download](#)

61.3d Bioprinting: A Ray of Hope

Jain et al [Download](#)

62. Strategic Breeding for Parasitic Resistance in Sheep

Pavithra et al [Download](#)

63. Ethanol's Hidden Gem: Unlocking the Potential of Distillers Dried Grains with Solubles (DDGS) in Animal Nutrition

Shalinee and Dilishma [Download](#)

64. Importance of AI and Interesting fact about poultry Reproduction

Parmar Sunil [Download](#)

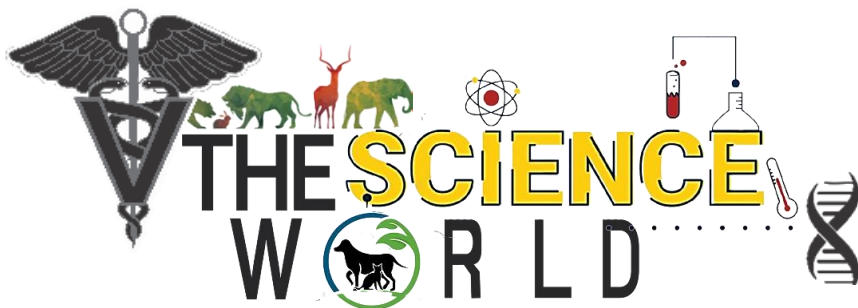
65. The Role of Open Nucleus Breeding and Moet in The Genetic Enhancement of Livestock

Devadharshini et al [Download](#)



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Popular Article

Environmental Degradation and the Use of Technology in the Agricultural Sector

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Introduction

Pollution of the environment is among the leading problems experienced in the present generation. With the increase in world population, the probability of food consumption also rises thus putting a lot of pressure on agriculture. These traditional practices have over the years posed a major threat to the environment in terms of soil erosion, water deficiency and loss of species genomes. However, the increase in technology provides positive intervention that would reduce on these ill-effects and enhance on sustainable agriculture.

Environmental Degradation in Agriculture

It has become evident that some of the common practices of farming affect the environment negatively. Key issues include:

- 1. Soil Degradation:** That is, they practice monoculture farming, excessive use of chemical fertilizers and pesticide hence resulting in the depletion of the soil. These are; soil erosion, decline in soil nutrients and soil organic matter. Debarred soils are not very fertile rich and are more susceptible to erosion hence the formation of a cycle of diminishing yield in agriculture related activities and escalating harm on the environment.
- 2. Water Scarcity:** It is estimate that agriculture uses about 70% of the fresh water usage globally on the global level fresh water usage. Poor methods of water application result into poor water drinking while high withdrawals limit the rate of replenishment of the water source. This complicates water availability issues and worsens water shortage in many regions especially areas that are arid and semi-arid.
- 3. Loss of Biodiversity:** This poses a problem mainly due to acquisition of more farmland, which endangers natural ecosystems and hence the loss of species. Mono-culturing is a bench mark of

large-scale production where there is creation of low genes pool in crops making it easy for pests and diseases to attack the crops. Also, chemical pesticides and herbicides are dangerous to the non-target species and thus leads to the reduction in species diversity.

4. **Greenhouse Gas Emissions:** Key gas includes methane from the enteric fermentation in a livestock and rice fields, nitrous oxide from soil nitrate, and carbon from the effects from the change in land use particularly deforestation. These emissions are in line with climate change and this deter the production of crops and other produces through extreme conditions of climate and rising causes of disastrous events.

The Role of Technology in Sustainable Agriculture

Technological advancement is being put into use to innovate agriculture that brings out some environmental impacts associated with ordinary agriculture. Key technological advancements include:

1. **Precision Agriculture:** Precision agriculture is a method that applies technology solutions like GPS, remote sensing, and data analysis on field level. Through the efficient measuring and controlling of inputs such as water, fertilizers and pesticides among others, the farmers can cut down on the wastage, increase production as well as cut down on adverse impacts to the environment.
2. **Drones and Satellite Imagery:** Farmers then get bird's eye view from drones and satellites and can monitor crop health, soil conditions, and pest infestations in real time. This makes it possible for the causal factors to be addressed before they cause major complications, and less use of chemicals, time and money is made.
3. **Sustainable Irrigation Systems:** A few of the examples include drip irrigation and the use of automatic systems to water the plants; they reduce the use of water by providing water to the roots of the plant. These systems help in minimising wastage of water while at the same time enhancing the efficiency of utilising water in the production of crops hence making farming less straining in regions that experience water shortage.
4. **Biotechnology and Genetic Engineering:** Genetic crop engineering has also been enhanced by modern Biotechnology to allow for the production of crops that can withstand several pests, diseases and weather conditions. Use of GM crops can help in the reduction on the use of chemical inputs, enhance production and also help to adapt to climate change.
5. **Renewable Energy in Agriculture:** The adoption of renewable energy sources, especially direct sunlight and wind energy in powering farming activities are some ways through which the dependence on non-renewable sources of energy can be minimized hence decreasing emission of Greenhouse gases. Renewable energy use in agricultural can be done through solar irrigation for instance, and use of wind power for energy production on the farms.



6. Organic Farming and Agroecology: Organic farming and the practices under the Rights of Persons to the Seeds and Agricultural Biodiversity allow use of natural inputs and promotions of ecosystem value. These practices also lower the impact of agriculture on the environment and increase sustainability in the long run.

Conclusion

The issues of feeding the world's growing population combined with the task of minimizing the negative impacts of the agricultural industry on the environment remain the key concerns in the sector. And whereas the conventional practices have been known to cause soil degradation, technological interventions signify the way forward to leading sustainable land use. The use of precision agriculture, efficient irrigation techniques, and biotechnology as well as advancing on renewable energy sources can help minimize the agricultural footprint on earth and feed the global population in the future. Sustainable agriculture maintains the conservation of resources not only in the environment but also in ensuring sustained and sustainable production of crops.

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