Chapter 9
Future of Farming: Integrating the Metaverse Into Agricultural Practices

Anurag Shrivastava
https://orcid.org/0009-0007-2869-922X
Saveetha Institute of Medical and Technical Sciences, Chennai, India

Satya Subrahmanya Sai Ram Gopal Peri
https://orcid.org/0009-0003-6729-9692
Accenture, Bengaluru, India

Sheela Hundekari
Pimpri Chinchwad University, Pune, India

Saif O. Husain
College of Technical Engineering, The Islamic University, Najaf, Iraq

R. V. S. Praveen
https://orcid.org/0009-0009-6683-5573
LTI Mindtree, Houston, USA

Saloni Bansal
GLA University, Mathura, India

ABSTRACT

The growing population of the world, the problems caused by climate change, and the environmental sustainability issues generated have marked a turning point in the agriculture sector. This is driving the fast adoption of technology innovations such drones, artificial intelligence (AI), Internet of Things (IoT) devices, and precision farming by the sector. The goal of a new field of research using blockchain technology, augmented reality, and virtual reality (VR) is including the metaverse into agricultural methods. By means of data-driven insights, immersive training, remote cooperation, virtual farm management, and customer interaction, this study explores the ways in which the metaverse may transform the agricultural industry. Virtual environments have great potential to greatly boost output, sustainability, and worldwide knowledge exchange. The results of this research indicate that the long-term evolution of a sophisticated, networked, environmentally friendly farming system will depend much on the metaverse.

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1. INTRODUCTION

People believe that the farming business will alter a lot in the near future. We need to modify the way we farm right now since the world's food demands are growing, climate change is becoming worse, and traditional agricultural techniques are getting closer and closer to their limits. This change is not simply required; it is absolutely imperative. The metaverse was the first thing that existed. The term "metaverse" refers to a shared virtual realm that is made feasible by technologies such as augmented reality (AR), virtual reality (VR), mixed reality (MR), blockchain, artificial intelligence (AI), and high-speed internet. It shows how technology and farming have changed in some of the most important ways. This digital world, which is both immersive and interactive, is transforming how we communicate knowledge about farming, make choices, and manage food systems (Al-Sartawi, 2020). People are now seeing this digital world as a possible new frontier for transforming these areas of farming. In this article, we'll talk about the many options and probable long-term repercussions of using the metaverse in farming. The goal of this article is to talk about the different choices that have been spoken about before. The metaverse is a digital realm that is always on and connected to the internet. People from all walks of life, including farmers, scientists, policymakers, and consumers, may work together, simulate, and interact with agricultural data and systems in real time. People refer to this area as the "metaverse." This is always true, whether the people using it are farmers, individuals, or consumers. One objective is to digitize procedures that are currently in place, and another is to find new methods to run and enjoy farming in the digital world. The idea is to achieve both of these objectives at the same time. For example, a farmer may go to a virtual duplicate of their farm without ever leaving their house. They can look at the soil's qualities, estimate the yields, receive support from AI-powered pest management professionals, and get hands-on instruction. People can perform all of these things from the comfort of their own homes. In the metaverse, farming is no longer science fiction; it is the new reality.

One of the most important things that has to happen for this transition to happen is the creation of digital copies of farms and fields. These digital replicas use information from sensors that are linked to the Internet of Things, drones, satellites, and weather systems to depict how actual assets work in real time. The goal is to make things operate like genuine things. They are always evolving and are not static. They feature models of a lot of things, such using water, expanding farms, insect infestations, and environmental pressures (Boulos & Burden, 2007). The digital twins of the metaverse are becoming better and better all the time. This makes it feasible to make decisions based on predictions, use resources more efficiently, and put preventative measures into place. Studies on smart agriculture have already demonstrated that these sorts of data-rich environments may considerably boost

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