Opinion
Volume 10:7, 2022

Journal of Biodiversity & Endangered Species

ISSN: 2332-2543 Open Access

Future of Soil Science and Agroecological

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Abstract

Organic farming upholds the values of health, ecology, fairness, and caring for all, including the soil, with the goal of promoting human welfare without endangering the environment. Modern organic farming is a concept that combines science, innovation, and tradition. Although history claims that the organic lifestyle movement was first identified in 1905, it gained traction in the late 1990s as people began to realise the negative impacts of modern agriculture. The British botanist Sir Albert Howard, who is frequently cited as the originator of contemporary organic agriculture, researched indigenous Indian farming techniques in 1905 and later grew to value them above mainstream agricultural science. Masanobu Fukuoka, a microbiologist in Japan who specialised in soil science and plant pathology, left his position as a research scientist in 1940 and went back to live with his family.

Keywords: Organic Farming System • Human welfare • Organic agriculture

Introduction

Modern technologies and disciplinary understanding of ecology, along with agroecological techniques, will be crucial in enhancing the effectiveness, profitability, and sustainability of contemporary agricultural management systems. The 10 elements of agroecology as outlined by the Food and Agriculture Organization of the United Nations-diversity, co-creation and sharing of knowledge, synergies, efficiency, recycling, resilience, human and social values, culture and food traditions, responsible governance, and circular and solidarity economies-will also be achieved in large part thanks to improvements in soil quality, health, and security. Agroecology and soil science research, however, has a number of knowledge gaps, including but not limited to the optimization or replacement of inputs and/or outputs, the efficient and appropriate collection and analysis of data, the quantification of agroecosystem services, and the accounting for social, economic, and political aspects in the research and systems [1].

Description

Modern technology integration may act as a stimulus to close these gaps. Strong remote or close-range sensing technologies, such as those based on satellite or airborne sensors with multi-/hyperspectral and thermal capabilities, may be among them. Big data analysis is now possible thanks to recent developments in statistics and computer science, as well as the Internet of Things and artificial intelligence (e.g., machine learning and deep learning), which increase crop monitoring, management, and production. The International Union of Soil Science has released "The Future of Soil Science." It is beneficial to look back "again" at what has been accomplished and what we have learned from the past in light of the major changes that have occurred in science, technology, and society since that time. We cordially invite all of our colleagues-young and old-working on soil science and agroecology research on all continents and from a variety of backgrounds. We encourage writers to view this research topic as a special chance to share lessons learned from the past and offer guidance for future research and applications. We welcome manuscripts of all categories, from A to D type articles [2].

Ecology is the study of how people, animals, plants, and their environments interact with one another as well as how these interactions are balanced. The use of ecological principles and concepts in farming is known as Agroecology encourages agricultural methods that; Reduce emissions, recycle materials, and give local supply chains priority to combat climate change. Work with wildlife, which includes minimising the negative effects of farming on wildlife and using nature to do labor-intensive tasks like crop pollination and pest management. Put farmers and communities in control by empowering local initiatives and adapting agricultural practises to the region's unique social, environmental, and economic circumstances.

Engaging with local farmers and producers is the simplest approach to support agroecological farming. Join a local veg box programme, become familiar with their farming methods, or purchase organic food. Food that is labelled organically is guaranteed to have been produced in accordance with some of the strictest environmental requirements. Everyone, including farmers, caterers, retailers, and everyday residents, must promote a new way of thinking about food, farming, and the environment in order to realise an agroecological future. With the help of the organic community, we continue to advocate for agroecology in government so that decision-makers are aware of the benefits it provides for the environment, the climate, and human health [3].

Intensive land use alters the physico-chemical and biological composition of the soil, which has a negative impact on its quality and fertility. This is in response to the report of indicating ecologically sensitive tropical soil components are unable to mitigate the effects of intensive farming operations. Therefore, a serious decline in soil quality (SQ) may result in a permanent reduction in land production. Crops that are initially planted stay productive for a long time, but yields, particularly for plantation crops, tend to decrease over time. While low yield from other land uses may reflect a loss in soil quality (SQ) due to the sort of intensive land use involved in the production, this decline in productivity is typically linked to the natural ageing of the plants [4].

Agroecology uses a variety of strategies to address current problems in agricultural production. Even though agroecology initially focused mostly on crop production and protection issues, additional elements like environmental, social, economic, ethical, and development concerns are starting to become important. Today, "agroecology" can refer to a scientific field of study, an agricultural technique, or a political or social movement. Here, we examine

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Date of Submission: 02 July, 2022, Manuscript No. jbes-22-74384; **Editor Assigned:** 04 July, 2022, PreQC No. P-74384; **Reviewed:** 15 July, 2022, QC No. Q-74384; **Revised:** 20 July, 2022, Manuscript No. R-22-74384; **Published:** 26 July, 2022, DOI: 10.37421/2332-2543.2022.10.436

the various definitions of agroecology. For that, we examine the agroecology's historical development. Examples from the USA, Brazil, Germany, and France are provided. We research and talk about the development of various agroecological meanings. The 1930s are when the term "agroecology" first appeared. Agroecology was only known as a completely scientific field of study up until the 1960s [5].

Conclusion

A conflict between opposing paradigms is being fought for the direction of our food system. The industrialised, global food system, which produces a lot of cheap food but also has a negative influence on the environment, society, and diet, is on the one hand. A local, community-based system that produces better food while attempting to limit its negative effects on the environment and society is the alternative vision. While developing chemistry skills over the course of two quarters, we will investigate the underlying chemistry as well as the agroecology of these opposing paradigms. Can a humane, agroecologically sound agricultural system that limits environmental degradation meet the world's food needs? is one of the key questions that will guide our investigation. Can we produce wholesome food that is accessible to all? How did we end up here?.

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How to cite this article: Campesino, Sara Palomo. “Future of Soil Science and Agroecological.” J Biodivers Endanger Species 10 (2022): 436.