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Book

## Organic Farming for Sustainable Development

June 2023

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### Abstract

Organic farming has emerged as a critical approach in promoting sustainable development and addressing the environmental, economic, and social challenges faced by the agricultural sector. With a focus on biodiversity conservation, soil health improvement, and reduced chemical inputs, organic farming embodies a holistic and ecologically friendly approach to food production. Organic farming plays a vital role in sustainable development by protecting the environment, improving soil health, mitigating climate change, enhancing human health, creating economic opportunities, and contributing to food security and resilience. Its holistic and ecologically friendly approach makes it an essential component of strategies aimed at achieving a sustainable future for both agricultural systems and the broader society. Organic farming represents a fundamental shift towards a more sustainable and ecologically responsible approach to agriculture. By prioritizing biodiversity conservation, soil health improvement, and reduced chemical inputs, organic farming offers a promising pathway towards achieving sustainable development goals. The book includes the idea of different academicians, researchers, and policymakers to deliberate on this theme of utmost importance and suggest appropriate policy solutions

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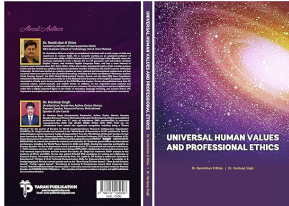
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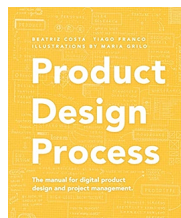
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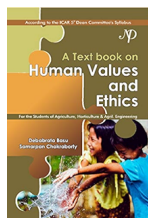
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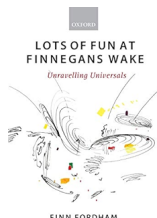
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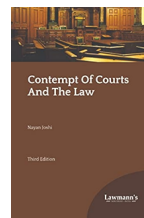
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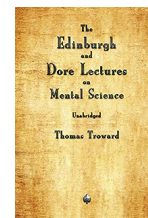
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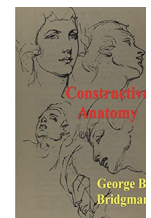
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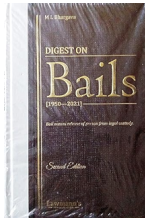
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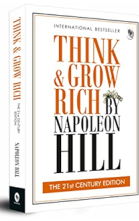
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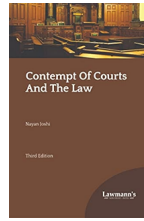
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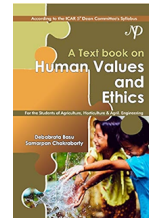


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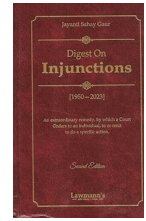


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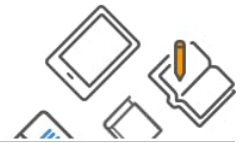


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#### Abstract:

In the last few decades, the application of Wireless Sensor Networks (WSNs) has been increasing drastically in wide range of fields. These WSN networks comprise of small sensor nodes that have limited battery capacity and cannot be replace or recharged. Therefore, it is important to utilize energy of sensor nodes effectively so that network lifespan is prolonged. In this paper, an effective energy efficient protocol is proposed that is based on chaotic maps and Artificial Bee Colony (ABC) optimization algorithm. The major objective of the proposed methodology is to reduce the energy consumption of nodes which automatically enhances network lifespan. To combat this task, initially network is initialized wherein nodes are deployed randomly across the sensing region. Since, selection of CH is one of the important tasks that define network efficiency largely. Therefore, in the proposed work Chaotic bee colony optimization technique is used for selecting CH in the network. The proposed technique analyzes three parameters like residual energy, node density and distance to calculate their fitness value. The node with best fitness value is selected as the CH in that cluster for particular iteration. In addition to this, the concept of relay node is introduced in the proposed model for reducing the burden on CH nodes. This relay node is used as intermediate for passing data from CH to sink node. The performance of proposed approach is analyzed in MATLAB software under different parameters.

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Owing to advancements in wireless connectivity, WSNs can be defined as networks that constitutes number of sensing devices which gather data by communicating with each other. These sensing devices are often called as sensor nodes and usually have a processor, storage, battery and transceiver for processing, storing data, power and communication respectively [10]. A typical WSN consists of one or more BS and thousands of small, intelligent, low-energy sensor node (SNs) (see figure 1) [18]. Usually, these nodes are statically distributed in the given sensing region, however in some cases nodes tend to move and interact with the physical world [12]. WSN are a good choice for a various application because sensor nodes may carry out a wide range of tasks, such as sensing the surroundings, communicating with neighboring nodes and in many instances performing simple arithmetic on the data collected [19], [15], [13]. But unfortunately, they have number of constraints like limited battery, storage abilities and network lifespan [10]. The nodes present in the network utilize their energy in number of ways, but a major portion of energy is utilized while processing the information and finding the route to deliver data. Due to energy and transmission spectrum limitations, it is critical to define and maintain routes in WSNs. The development of a routing algorithm that uses little energy is essential for extending the life of wireless networks [17]. Figure 1.

Basic WSN network

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