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A Study on the Impact Using Sustainable Agriculture to Reduce Greenhouse Gas Emission, Thereby Playing a Significant Role in Combating Climate Change

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A STUDY ON THE IMPACT USING SUSTAINABLE AGRICULTURE TO REDUCE GREENHOUSE GAS EMISSION, THEREBY PLAYING A SIGNIFICANT ROLE IN COMBATING CLIMATE CHANGE

THEME: SUSTAINABLE ENVIRONMENTAL MANAGEMENT

SUB-THEME: SUSTAINABLE AGRICULTURE

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ABSTRACT

Sustainable agriculture is way of farming in such a way that its benefit is enjoyed by future generations. The major aim of this thesis is to make agriculture a sustainable one and to make this sustainable we have brought a transformation in method of agriculture. Agriculture is something which is the reason for survival of various living. It's important to look after it and make changes in methodology so that consumption of land (which is an another resource) and increase the production In Today world population is increased so much that there is need for increasing the production but we can't use land resources in an unsustainable manner. So this project will show an alternative method to clear all the queries, by creating stable food in organic manner and promotes local communities.

KEYWORDS: Agriculture, Farming, Organic, Population, Production, Stable food, Survival,

A STUDY ON THE "IMPACT OF NEW NORMAL IN LEARNING & TEACHING PROCESSES CHEMISRTY"

INTRODUCTION

A sustainable agriculture approach seeks to utilize nature resources in such a way that they can regenerate their productive capacity and also minimize harmful impacts on ecosystem beyond a field's edge. Eco friendly farming practices:

Permaculture is a food production system which mimics how vegetables and plants grow in natural ecosystem.

- Aquaponics &Hydroponics.
- Using renewable energy resources.
- Crop rotation& polycultures.
- Trees can increase crop yields.

RATIONALE BACKGROUND OF STUDY

Primary objectives

- To Study on the impact using sustainable agriculture to reduce greenhouse gas emission, thereby playing a significant role in combating climate change.
- Sustainable agriculture rests on the principle that we must meet the needs of the present without compromising the ability of the future generation to meet their own needs.

REVIEW OF LITERATURE

Decoding systems biology of plant stress for sustainable agriculture development and optimized food production. K. Shameer , MBN Naika , KM Shafi Progress in biophysics (2019)

Plants are essential facilitators of human life on planet earth. Plants play a critical functional role in mediating the quality of air, availability of food and the sustainability of agricultural resources. However, plants are in constant interaction with its environment and often hampered by various types of stresses like biotic and abiotic ones

Recognizing the molecular factors driving plant stress-related events, and developing molecular strategies to aid plants to tolerate, resist or adapt to biotic and abiotic stress are critical for sustainable agriculture practice. We present various areas of scientific and

technological advances, such as increased availability of genomics data through whole genome sequencing that require attention.

Food safety affects everyone worldwide and will remain a global challenge to human health in the foreseeable future requiring the rapid, sensitive, efficient and inexpensive detection of food contaminants. Biosensors have long been investigated to be part of a solution.

In this review, the latest developments of biosensors addressing these issues are presented for the years 2015–2019 and point toward important new strategies needed to truly ensure safe food in a sustainable global market.

Biosensors have long been investigated to be part of a solution. In fact, current research trends of nanoscale science and technology, efforts of miniaturization and connectivity enabled through the internet of things boost biosensors' capabilities to a degree that they surely will play a major part of the answer to this global challenge. Surprisingly though, the adaption of such biosensors to function along the entire food value chain and hence also include important aspects of sustainable agriculture and food fraud has been neglected so far.

One health for food safety, food security, and sustainable food production, SN Garcia, BI Osburn, MT Jay-Russell, (2020)

Globally, our society faces an enormous challenge to feed, house, and provide a healthy life for the growing human population while preserving the environment and natural resources for the benefit of future generations. In order to meet these challenges, sustainable food production and environmental stewardship is paramount and will require a One Health approach. One Health is the concept that the health of humans, animals, and the environment are inextricably linked.

One Health curriculum in agriculture and food systems education programs can be a way to engage the next generation in farming, agriculture and improving public health through food safety and security. The One Health approach will enable them to acquire the information and develop the skills needed in cooperation, teamwork, and communication that will be necessary to address these challenges.

Farmers, consumers, researchers, government agencies, and consumer advocacy groups play an important role in influencing food safety policies and sustainable food production practices. One Health practitioners need to bring awareness to these stakeholders and provide them with information that allows them to make data driven decisions about food and food practices, and to enact policy and guidelines that protect food safety and safeguard environmental sustainability.

Sustainable agriculture embodies many concepts in its attempt to integrate all the aspects of farming systems into a holistic system. This book explores the processes that occur within the components of a sustainable system and shows where we can build upon our existing knowledge to develop the concepts of sustainable agriculture into the new conventional agriculture. Well-known researchers examine a variety of aspects, including production goals, environmental considerations, and economics, to build a knowledge base that allows readers to see where changes in agriculture must be made and how challenges can be met. They compare existing systems against definitions of sustainability and pinpoint those areas where improvements can be made in current systems to further the concepts of sustainability.

Unlocking plant resources to support food security and promote sustainable agriculture, T Ulian, M Diazgranados, S Pironon, (2020)

Biodiversity is essential to food security and nutrition locally and globally. By reviewing the global state of edible plants and highlighting key neglected and underutilized species (NUS), we attempt to unlock plant food resources and explore the role of fungi, which along with the wealth of traditional knowledge about their uses and practices, could help support sustainable agriculture while ensuring better protection of the environment and the continued delivery of its ecosystem services

This work will inform a wide range of user communities, including scientists, conservation and development organizations, policymakers, and the public of the importance of biodiversity beyond mainstream crops.

We highlight multipurpose NUS of plants from different regions of the world, which could be key for a more resilient, sustainable, biodiverse, and community participation-driven new "green revolution." Furthermore, we explore how fungi could diversify and increase the nutritional value of our diets. NUS, along with the wealth of traditional knowledge about their uses and practices, offer a largely untapped resource to support food security and sustainable agriculture.

Future challenges and perspectives for applying microbial biotechnology in sustainable agriculture based on a better understanding of plant-microbiome, JM Barea - Journal of soil science and plant nutrition, (2015)

According to information from specialized sources, demand for agricultural production is expected to increase by at least 70% by 2050. At the same time, people are becoming aware that sustainable agricultural practices are fundamental to meet the future world's agricultural demands (Altieri, 2004). This is why modern agriculture is being implemented on a global

scale and diverse research approaches are being undertaken addressed to meet environmental and economical sustainability issues, trying to save at most as possible usage of non-renewable natural resources. A recommended approach is that based on exploiting the role of soil microbial communities for a sustainable and healthy crop production, while preserving the biosphere.

A fundamental part of this review is devoted to discuss the future perspectives and opportunities related to: (i) improving our understanding of the plant-microbiome interactions; (ii) enhancing the ability of soil microbes for stress alleviation in crops.

Exploiting the interactions between soil microbial communities and crops is a relevant approach to increase food production for the growing world population at the lowest environmental costs, in the current scenario of global change.

The Implementation of the Food Safety Modernization Act and the Strength of the Sustainable Agriculture Movement.

In the wake of growing public concerns over salmonella outbreaks and other highly publicized food safety issues, Congress passed the FDA Food Safety Modernization Act in 2011, which placed more stringent standards on food growing and packaging operations. In negotiations preceding the Act's passage, farmers of local, sustainable food argued that these rules would unduly burden local agricultural operations or, at the extreme, drive them out of business by creating overly burdensome rules. These objections culminated in the addition of the Tester-Hagan Amendment to the Food Safety Modernization Act, which created certain exemptions for small farms. Proposed Food and Drug Administration (FDA) rules to implement the Act threatened to weaken this victory for small farm groups, however, prompting a loud response from small farmers and local food proponents.

The FDA's second set of proposed rules, issued in September 2014 in response to these and other complaints, were, perhaps surprisingly, responsive to small farmers' concerns. Using comments submitted to the FDA, this article explores the responses of the agriculture industry and public health organizations, as well as small farm groups, consumers of local food, and sustainable agriculture interests (which, for simplicity, I alternately describe as comprising the "sustainable agriculture" or "small farm" movement), to three aspects of the FDA's proposed rules—involving manure application, on-farm packing activities, and exemptions for very small farms—to assess the strength of the sustainable agriculture movement. The rules involving manure application and on-farm packing, it turns out, reveal little about the independent political strength of the local food movement, as large industry groups also

objected to these provisions. But for the third issue discussed here—exemptions for very small farms—the interests of sustainable agriculture groups were directly opposed to both industry and public health organizations, and yet prevailed. This suggests that the high salience of locavore and "slow food" issues might have allowed relatively small, dispersed interests to overcome traditional obstacles to political organization, and that the sustainable agriculture movement has indeed become an effective political force.

METHODOLOGY

Research design:

Using multi layers of crop bed in certain field and planting different types of vegetable and fruits in a specific area with suitable sensors.

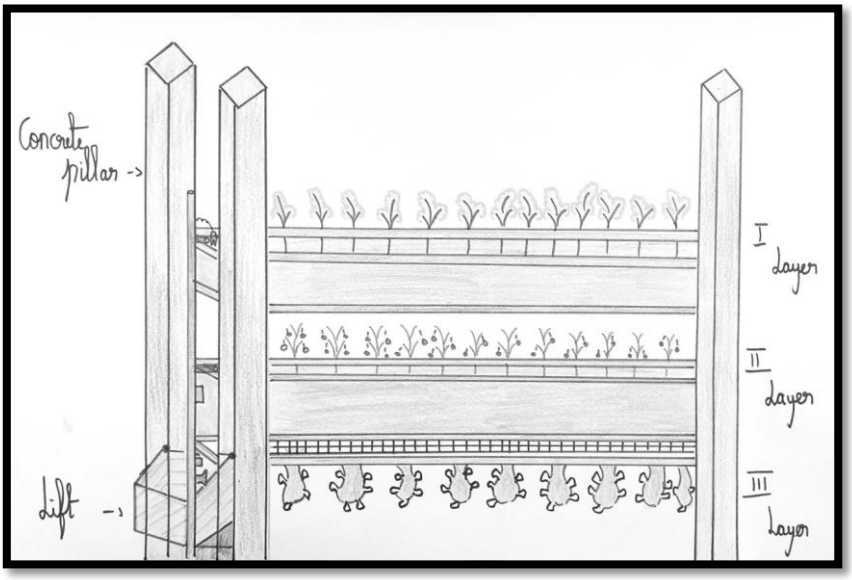
Research procedure:

This is the next version of modern agriculture. we are going to build three layer of crop bed. In first layer crops and pulse will be planted since it requires more sunlight and we have to pass water twice a dayin second layer fruits and vegetables (beets, carrots, and potatoes) will be planted since it required less sunlight and we have to pass water once a day.

In third layer we are going to plant mushroom since no sunlight is required for the growth of the mushroom, we have to moisture the dark room for the growth of the mushroom.

We are using mixture of cocopeat, manure and ash for the growth of the (crop, fruit, vegetable) other than soil, which keeps the crop bed more moisture because cocopeat absorbs more amount of water and we are using organic manure which increase the amount of humus in the crop bed and it gives more production with high content of protein, vitamin and minerals. We are using soil moisture sensor, humidity sensor to regulate and take care the crop bed. And also we have to give certain code for each crop bed for its suitable growth.

Architecture:



Description:

- First we have to build four vertical concreate pillars and we have to attach cast iron bars in horizontal way to separate three layers.
- In third layer we have to cover with polycarbonate sheet to make the room dark and top of the third layer we have to attach rod's to hang the mushroom hanging bag.
- In second layer we have to cover with 2-feet polycarbonate sheet to hold the mixture of cocopeat and we have to leave certain space for sunlight which could enhance the growth of the fruits and vegetable example (beets, carrots, and potatoes) plants.
- In first layer we have to cover all the four sides of pillar with 2-feet polycarbonate sheet to hold the cocopeat mixture, we are supposed to leave it as open area and also we are planting crops and pulses in first layer.
- We have to attach water pipes, sensor (soil moisture sensor, humidity sensor) and lift (which take you to all the three layers) at the left or right side of the pillar's.
- We are using cast iron, because this bar are stronger compare to other iron bars.

Ethics statement:

Motive of this project is to reduce food shortage among people and promotes local communities and main thing is to protect our production from pest attack's, flood, hazardous chemical etc. since nowadays most of the production is being destroyed by flood and most importantly, while using this method we can produce organic fruits, crops, pulses, mushroom and vegetable.

EXPECTED OUTCOMES

It will increase the production. It contains high vitamins, minerals, and protein compare to normal one because the plants are grown in organic manner.

While using this method we had a chance to protect our land and production from flood and insect attacks and hazardous chemical etc. While using this method we can reduce the water usage for crop.

Costs and Funding:

Due to our Indian market price for cement, bricks, cast iron bar, sensors, polycarbonate sheet etc … the Approximately price is Rs 50,000 to 75,000.

LIMITATIONS OF THIS STUDY

- While using this method the farmer should know about this process and he must study the manual of this project.
- This is the onetime investment but also cost of the project is little bit high.

CONCLUSION:

Food, clothing and shelter are the basic needs for a human being to live. Without any one of this it makes human life impossible to survive. Now a days people don't get food properly since the rate of agriculture have been decreased example (OMR before 20 years back all the land are agriculture land, but today there is no agriculture land because of population) . Certain people don't know the proper way to plant crops and they don't show care in taking care of crop in this busy world. Through agriculture also we can reduce pollution. Sustainable agriculture is beneficial because it reduces pollution; creates a stable food supply and promotes local communities.

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

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