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Sustainable Agriculture: Decoding the Prospects

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ABSTRACT

India, being a developing country is growing at a very fast pace. Growth and development process goes accordingly with the increase in population. This population is dependent on resources are inefficient to sustain its longevity.Food production is the utmost requirement of population.With this it's sustainablity requires serious attention.Thereby, sustainable agriculture has to be addressed with environmental conditions to be taken into consideration for food production for the millions to be feeded for the forthcoming generations.

Keywords: Inefficient, Longevity, Sustainablity, Agriculture, Population, Generations.

Sustainable Agriculture is prevalent term in the present times, In order to understand the term profencially, the literal meaning of sustainable needs to be identifid i.e. involving the use of natural products and energy in a way that does not harm the environment. When, we associate sustainability with agriculture, it identifies the conservation of natural conditions of soil, water etc to be used for agricultural produce. It can be explained as production of food in environmentally secured ecosystems according to the report of (FAO, 2017). It has been reported by the world organizations that 70% more food production will be required for estimated 9.6 billion world population with their recommended daily calorie intake. Therefore, sustainability in agriculture is a need of an hour to promote economic stability for farmers and to maintain the natural conditions.

What is Sustainable Agriculture?

Sustainable Agriculture is a farming method that aims to protect the environment, use resources efficiently and meet the needs of current and future generations. It also aims improve the quality of life for farmers and the community. The word-sustain, comes from the Latin word sustinere (sus-, from below and tenere, to hold) to keep in existence or maintain implies long term support or permanence. As it pertains to agriculture, sustainable describes farming systems that are capable of maintaining their productivity and usefulness to society indefinitely.

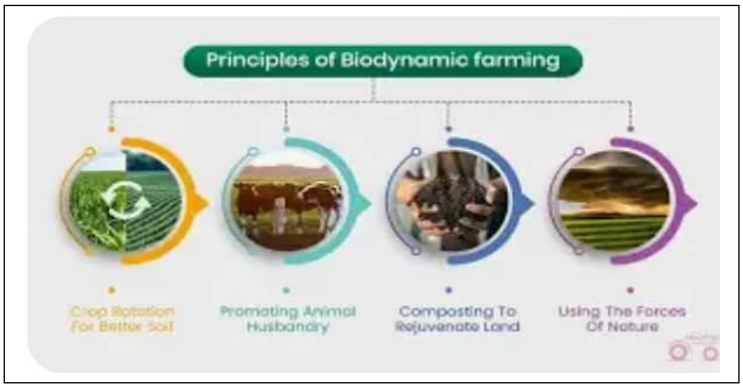
Techniques for adoption of sustainable farming are :-

- **Crop Rotation** means growing different crops in the same field in a sequence in diffrent seasons to prevent soil depletion and control pests. It has been a prevalent practice all over the world since ages to replenish the minerals and nutrients of the soil.

Crop Rotation

- **Integrated Pest Management** (I.P.M.) using a combination of biological, cultural and chemical methords to manage pests and diseases.
- **Conservation Tillage** Reducing or eliminating conventional tillage activities to reduce soil disturbance and erosion.
- **Cover Crops** Planting crops like clover, rye and haiyry vetch during the off-season to maintain and improve soil health.
- **Mulching**Adding organic materials to the soil surface to improve water retention and nutrient cycling.This method is adopted for sustainable agriculture to build pollution free environment and to promote profitable commercial agriculture.
- **Biodynamic Farming** is a form of alternative agriculture based on psendo-scientific and esoteric concepts initially developed in 1924 by Rudolf Steiner. It was the first of the organic farming movements. It mainly works on the relationship between plant growth and cosmic rhythms and emphasizes the importance of maintaining sustainable soil fertility. Biodynamic farming is different from organic farming. As, many organic farms only grow crops or only raise livestok. While this may be more efficent, it can lead to imbalances like nutrient deficiency. Biodynamic farms unite plants, conscious relationships. That way they support each other and create balance.

Biodynamic Farming



- **Permaculture** The term ‘permacultre’ was coined in 1978 by Australian professor Bruce Charles (Bill) Mollison, Permaculture is a holistic approach to design agricultural systems and land management that is inspired by nature. It aims to reduce waste, pollution and the impact on the environment, while also increasing sustainability and biodiverty. It works by using natural patterns to design systems that are self sufficent and sustainable. Permaculture uses biological resources to reduce the need for industrial technologies based on energy and creates pollution free environment.Permaculture often includes domesticated animals to help with nutrient cycling, need maintenance and pest control. And, it uses rainwater harwesting to help with water management.Permaculture helps in reducing waste and pollution. It improves the land’s resiliency and biodiversity. It can help to product wildlife. Permaculture can help ensure access to clean water, air and food.

Organic Farming →  ← **Permaculture**

- **Urban Agriculture** Urban Agriculture is the practice of cultivating crops, livestock, a types of food in an urban environment. The term applies to the area activities of animal husbandary, aquaculture, beekeeping and horticulture in an urban context. Urban argiculture can appear at varying levels of economic and social development some of the first evidence of urban agriculture comes from early mesopotamiam cultures. The

benefits of urban agriculture for cities are numerous. Cities transformation from food consumers to generators of agricultural products contibutes to sustainability improved health, and poverty alleviation. Urban Agriculture creates circular energy loops in which food is consumed in the same place. It is produced and waste is not exported to the peripheral rural areas.

Urban Agriculture

Waste water and organic solid waste can transformed into resources for growing agriculture products. The former can be used for irrigation, the latter as fertilizer. Vacant urban areas can be used for agriculture production instead of sitting unused. U.P.A. is a very effective tool for fighting hunger and malnutrition. Since it tackles assess to food for an impoverished sector of the urban population. A large part of urban agriculture involves the urban poor. In developing countries, the majority of urban agricultral production is for self consumption, with surplus sold in the market.

- **Hydroponics and Aquaponics**Hydroponic farming is a method of growing plants in a water based nutrient solution instead of soil. It is a type of horticulture that uses an artificial environment to grow crops and medicinal plants. In this process, plants are rooted in a growing medium like perlite, coconut coir, or vermiculite. In this, the nutrients are added to the water to feed the plants. The plants draw nutrients from the solution through the roots. The roots need to be aerated. It proves to be lightly beneficial as it conserves water and land both and it helps in reducing environmental damage and species extinction. And, hydroponic systems can produce higher yields than traditional farming and benefiting small farmers growing herbs like basil, cloves, cilantro, till, mint, oregano, parsley, rosemary and thyme with fruits and vegetables like tomatoes, cucumber, pepper, eggplants, watermelons and melons.
- Agroforestry is the production of trees and non tree crops or animals on the same piece of land. The crops can be grown together at the same time and can be grown in rotation, or can ever be grown in separate plots when materials from one are used to benefit another. It is also known as agro-sylviculture or forest farming.It is a land use management system that integrates trees with crops or pasture. It combines agricultural and forestry technologies. As a polyculture systems, an agroforestry system can produce timber and wood products, fruits nuts and other edible plant products, edible mushrooms, medicinal plants, ornamental plants, animal products and other products from both domesticated and wild species. Agroforestry has economic, environmental and social benefits. It improves farm productivity, healthier environment, reduction of risk for farmers, increased farm profits, reduced soil erosion, creating wildlife habitat, less pollution managing animal waste, increased biodiversity, improved soil structure and carbon sequestration.

CONCLUSION

Different sustainable agriculture practises are used to secure environment and to produce maximum profit while practising agriculture. The above methods can be used to ensure profitability, productivity and sustainability in the farming systemsfor longer run for the present and coming generations to come.

Securing environment with limited use of resources in a well defined manner can ensure the “Mother Earth” to feed the billions with same agricultural productivity.

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