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Climate Resilient Agriculture

Climate-resilient agriculture is a technique of using existing natural resources in a sustainable manner with agriculture and livestock farming system to achieve increased long-term productivity and farm profits in the view of climate variability. It practices mainly consist of structured methods for managing essential inputs such as land, water, crop production, and livestock management. It appears that inventions and organizations are important in accelerating the adoption of Climate-resilient agriculture practices. In the face of globalization, this practice helps future generations avoid poverty and starvation. These approaches have the potential to implement a new situation and sustain agriculture on a local, regional, and global scale, particularly when done in a sustainable way. Climate-resilient practices lead to increased access to and usage of technology, open trade regimes, increased use of resource management technologies, and enhanced crop and livestock adaptation to extreme forms.

INTRODUCTION

Globally, agricultural systems are becoming increasingly vulnerable to climate change. Climate change has severe effects for agriculture, particularly impacts on development factors such as water scarcity and soil fertility (Piao et al., 2010), as well as pest and disease-related damage to crops. Moreover, depending on the geographical area of the farms and socio-economic status of the farmers, the overall effects of climate change on agriculture can be positive or negative. As the world's food security is threatened, a boom in the adoption of climate-smart agricultural practises and technologies has occurred. The Food and Agriculture Organization describes climate-smart agriculture as a strategy to guiding actions needed to modify and reorganise agricultural systems in order to effectively support production and ensure food and nutrition security in a changing climate. Climate-resilient agriculture is characterised as "agriculture that reduces poverty and hunger in the face of climate change while improving resources on which future generations rely".

STRATEGIES AND TECHNOLOGIES FOR CLIMATE CHANGE ADAPTATION

In global level to minimise the negative impacts of climate change, farmers and other stakeholders around the world are adopting a range of climate-resilient practises, innovations, and approaches. Farmers and other stakeholders all over the world are using a range of climate-resilient practises, innovations, and methods to minimize the harmful effects of climate change. In India, some important polices and schemes are implement to promoting the climate resilient agriculture.

CROP MANAGEMENT STRATEGIES

Crop rotation, drought-tolerant varieties, short-season crop and crop shifts to new crops, legume intercropping, crop diversification, and changing planting dates are some of the most common climate-resilient crop management techniques used by farmers. Crop rotation, or growing a series of crops on the same piece of land, is commonly used and can help with a variety of agro-ecological issues such as declining soil quality and greenhouse gas emissions.

Increasing soil organic matter is a long-term strategy for increasing crop production while also increasing carbon sequestration and keeping the global carbon cycle in check. Despite the fact that genetically modified crops offer numerous advantages in agriculture, the use of GM food crops is highly debated.

WATER MANAGEMENT STRATEGIES

Water management is critical for the global agriculture sector's sustainability, given the decline and contamination of freshwater resources. Irrigation is the most widely used technique to increase yields and reduce yield variability across countries. However, choosing an effective irrigation system is critical for ensuring the long-term viability of limited water supplies.

In India, many drought-prone states are increasingly adopting the water saving technology such as sprinkler and drip irrigation systems under the National Mission on Micro Irrigation (Viswanathan et al., 2020). Furthermore, climate-resilient water management strategies such as laser land levelling strategy.

SUSTAINABLE LAND MANAGEMENT STRATEGIES

Sustainable land management is defined by the United Nations as "the use of land resources, including soils, water, livestock, and plants, for the development of goods to meet changing human needs while simultaneously ensuring these resources' long-term productive capacity and maintaining their environmental functions." Soil Health Card Scheme launched by India in 2014, to provide information on the use of fertilisers and planting of suitable crops based on soil quality. Furthermore, nature-based solutions, such as organic farming, rewilding, and sediment trapping, have been shown to be long-term land management strategies. Despite its lower productivity in comparison to conventional farming, organic farming is widely regarded as a sustainable farming practise.

Efforts to Improve Livelihoods (Livestock, Fisheries and Agro forestry) it is crucial to develop climate-resilient agricultural practises, particularly in developing and emerging economies, where agriculture is the primary source of income for a large proportion of rural households. Integrated farming systems, which combine crop production with a variety of livelihood activities, including livestock sector, are considered a sustainable solution. It has been discovered that integrated farming promotes agro-biodiversity and diverse food-based land resource management activities, which strengthen agro-ecosystem resilience to climate change. Integrated rice–fish farming is preferred over mono cropping because it improves resource utilisation, diversity, and productivity. It also increases soil fertility by increasing phosphorus and nitrogen levels, lowering greenhouse gas emissions by reducing the use of chemical fertilisers.

CONCLUSION

Climate-resilient agriculture is the emerging global patterns of agriculture practices in the impact of climate change. In global level, several strategies are adopted by farm households to address the impacts of climate change on agriculture and farm livelihoods. Climate-resilient agriculture has enormous potential to become a turning point in global agriculture history by introducing a holistic approach to achieving food and nutrition security using current and newly emerging agricultural practises.

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