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MITIGATION OF CLIMATE CHANGE EFFECT THROUGH MILLET CULTIVATION

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In a world fight with the demolishing of climate change, we're always searching for solutions. From transitioning to renewable energy to reforesting our landscapes, the fight for a sustainable future requires a multi-pronged approach. And nestled within this intricate web of solutions lies a humble grain – millet.

This ancient grain, often overlooked in favor of its more popular cousins like rice and wheat, holds the potential to be a powerful ally in the battle against climate change. So, how exactly can a seemingly simple grain like millet contribute to a healthier planet? Let's delve deeper into its remarkable capabilities. Millets farming Impact on Climate Change.

Millet's potential for climate action stems from its inherent resilience and adaptability. Unlike many other staple crops, millet thrives in challenging environments, making it a valuable asset for regions facing drought, heatwaves, and erratic weather patterns. Here's a closer look at its climate-friendly attributes.

The inter linkage between climate change and agriculture are multidimensional and complex. Crop response to climate change depends on the location specific baseline climate and soil condition thus, no consensus has emerged so far on how food grain production will be affected by climate change impact in India. Although some authors are in a strong view that climate change will have negative impacts on food security . As per Prof. M.S. Swaminathan there will be a decline of asian food grain production due to climate change. International Rice Research Institute (IRRI) has indicate that a one degree increase in temperature could cause rice yield to drop by 10 percent. Some climatic conditions and their biophysical impact on agricultural environment that can reduce crop yield are:

1. Erratic rainfall conditions.

2. Temperature rise leading to increased soil evaporation & evapo- transpiration from plants.
3. Soil moisture stress.
4. Extreme weather events like cyclones and typhoons.
5. Heat waves.
6. Increased weed, insect pest and disease challenge through temperature and humidity rise.
7. Soil erosion and loss of soil organic matter due to extended dry spells and increased frequency of heavy rainfall events.

Millet cultivation Potential to Reduce Negative Impacts of Climate Change

Millet offers multiple benefits against the background of the various climate change implication for agriculture. The following elements of Millet farming are of particular relevance for reducing externalities of other crops farming in the perspective of climate change.

Water Efficiency: For Millets farming requires significantly less water comparison to other major Stable food grain. This remarkable water efficiency makes it a perfect crop for regions grappling with water scarcity, a growing issue exacerbated by climate change. Millet has low requirement for surface irrigation and groundwater supplies. They can grow in arid region, upland region like NE state with high erosion rain or No rainfall and under non-irrigated conditions.

Climate Resilience: Millets can tolerate a wide range of temperatures, from heat waves to droughts, and can even survive in saline, acidic conditions.

Environmental Friendliness: Millets are naturally organic and don't require chemical fertilizers or pesticides. Millet farming demands for reduced use of chemical fertilizers and pesticides coupled with higher input of organic manures. These practices reduce the risk of groundwater contamination and enhance soil quality, including water retention capacity of the soil. In addition, it's helps to increase the resilience of traditional cultivation system to various climate related risks. This is mainly a result of the more robust and healthy plants and the larger and eco friendly root systems that evolved under Millet farming.

Carbon Footprint Reduction: Millets are C4 cereals, which means they convert more carbon dioxide into oxygen.

Food Security: Millets can address food and nutritional security concerns, especially in regions with environmental challenges.

Sustainable Agriculture: Millets can support sustainable agriculture without harming the environment.

Other benefits of millet cultivation include:

- Low investment expenses
- Low susceptibility to disease and pests
- Long preservation without insect damage
- High in calcium, dietary fiber, polyphenols, and protein
- Reducing pressure on vulnerable ecological systems.
- Enhancing resilience of the rice cultivation system.
- Improving farmers overall livelihood situation and
- Building adaptive capacity of farmers as the key human resource in agricultural system.

Millets Potential for Controlling to Climate Change Mitigation

Agriculture has been shown to produce major effect on climate change, primarily through production System through huge irrigation biased farming and release of green house gases such as carbon dioxide, methane and nitrous oxide. Rice and others more water friendly crop production is considered to main cause of rising methane emissions from the agriculture sector during the past century. A study of green house gases emission from irrigated rice in India revealed that total methane emission in kharif season ranged from 24.5 to 37.2 kg/ ha.

Millets farming has therefore often been subject to discussion on how change in agriculture practice can contribute to climate change mitigation. Under the conventional methods of cultivation methane is emitted by bacteria that thrive in flooded fields which decomposes manures, fertilizers and other organic matter in oxygen free environment. The gas is emitted through the plants or directly into the atmosphere. Thus, by avoiding the flooded conditions on fields, millets can help bring down methane emission from flooded cultivation. Millets contributes to mitigation of climate change through a lever also. Through requiring precise dosage of irrigation water, it helps reduce energy consumption for operation of water pumps. And therefore has a potential to mitigate carbon emission from burning of

fossils fuels for power generation. Finally, another factor of mitigation of green house gases emission through millet cultivation is the reduced need for application of chemical fertilizers. Production of chemical fertilizer is associated with significant energy and process related green house gases emissions which outweigh the respective green house gases footprint of organic fertilizers.

Conclusion

Millet farming offers multiple benefits for reducing vulnerability of agricultural system and livelihoods to climate variability and change. It helps to reduce pressure on vulnerable ecological system by reducing irrigation water requirement and need of pesticide inputs and chemical fertilizers. Millet enhances the resilience of cultivation system against climate risk.

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