

How to tackle effects of global warming on agriculture?

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Abstract— Agriculture is going to suffer because of global warming in future. so here we can discuss basic tactics to tackle the effects of global warming on agriculture. Agriculture plays the key role in economy and provides food and livelihood activities to much of the countries population. Due to global warming the frequency of droughts in several countries has increased whereas flooding in several disrupted the food production. The solution will build the capacity to recover quickly from difficulties on our farms and in our food supply as we face the challenges ahead. Due to this conditions it will take all hands to move us towards a more hopeful climate future

Keywords— Agriculture, Climate change, global warming

1. INTRODUCTION

The impacts of climate change acutely through increased drought, extreme weather events, and wildfires. The time to take action is more urgent than ever. We've listed a few important ways sustainable farmers are doing to fight climate change. Many of the farms in our farmers markets, taking the lead in this fight while bringing delicious food to our tables: using organic practices, advocating for policy change, and more. It will take all hands on to move us toward a more hopeful climate future. These techniques will also build recovery process on our farms and in our food supply as we face the challenges ahead.

2. THE WAYS FARMERS CAN FIGHT GLOBAL WARMING

A. Efficient Irrigation Management

Conserving water use is vital to any farm, particularly in times of drought. But given that the majority of energy use on farms is from groundwater pumping, irrigation efficiency is also key to reducing fossil fuel consumption and greenhouse gas (GHG) emissions. Water- and climate-wise farmers can use an methods to save water and reduce energy consumption—such as using drip irrigation, planting cover crops, dry farming, and more..

B. Renewable Energy

Maximizing energy efficiency and shifting away from fossil fuels are important steps that farms can take to reduce their climate footprint. This can include on-farm renewable energy production such as solar panels and wind turbines, minimizing use of petroleum-based fertilizers and pesticides,

and reducing dependence on fossil fuel inputs for farming, storage, and transportation of crops..

C. Organic Energy

Since the middle of the twentieth century, the industrialization of agriculture has led to widespread dependence on petroleum-based pesticides, herbicides, and fertilizers in conventional farming. Organic farming prohibits most synthetic inputs, which means reduced GHG emissions, as well as cleaner soil, water, and food. Furthermore, organic and sustainable techniques bring additional benefits for farmers, such as increased soil health and fertility, which leads to additional climate-friendly benefits

D. Increasing Soil Health

A major set of sustainable practices that shows great potential for mitigating and even helping to reverse the effects of climate change is carbon farming. Through photosynthesis, plants serve as carbon sinks to draw CO₂ out of the atmosphere. About 40% of that carbon then gets deposited into the soil, where it feeds microorganisms like bacteria, fungi, protozoa, and nematodes. Those creatures, in return, give mineral nutrients to the plants, providing a natural fertilizer. Farms can support this process of carbon sequestration by increasing plant matter and building soil fertility through practices such as compost application, planting cover crops, and reduced or no-till cultivation.

E. Keeping Agriculture Green

Land management practices such as reforesting rangelands, restoring riparian zones, and planting hedgerows and other perennial plants serve many benefits, such as providing shelter for wildlife, beautifying farms, and attracting beneficial insects for pollination and natural pest control. On the climate front, trees, shrubs, and other woody vegetation also store carbon in their biomass, protect the soil from erosion, and conserve water.

F. Reducing Livestock Methane Emissions

Agriculture is responsible for methane emissions from beef and dairy livestock are the primary source. Through anaerobic decomposition, manure lagoons on industrial dairy and cattle farms (concentrated animal feeding operations, or CAFOs) create harmful emissions and pollute our water supply. Holistic pasture-based livestock management through practices like rotational grazing can help to mitigate this

impact, since grasses provide high-quality forage that is better for cattle's digestion, while their hooves break up soil and manure as they move through rangelands helps to fertilize the soil.

G. Pasture-based Livestock Management

Over half of California's land is rangeland, which holds great potential for carbon sequestration. This all contributes to soil health and microbial life, while helping perennial grasses grow and storing water in the soil.

H. Protecting Farmland

We lose at least 40,000 acres of farmland each year due to development pressures. This is bad news for not only our food supply, but also the climate, given the potential for sustainably managed farm and rangeland to sequester carbon and reduce GHG emissions. Farmland conservation also preserves local food sources, protects wildlife habitat, and promotes biodiversity, among other climate-friendly impacts.

I. Support Farmers Markets and Local Foods

Did you know the food travels an average of 1,500 mile to get to your plate? All this shipping uses fossil fuels and other natural resources, and generates GHG emissions. When farmers sell directly at the farmers market or through other local distribution channels, food is transported shorter distances, conserving those resources (the average distance farms travel to the Ferry Plaza Farmers Market is about 100 miles). Supporting local farmers at the farmers market keeps farming viable, so that farmers can stay on their land and be successful growing food that sustains us while caring for the earth.

J. Pushing for Climate-Friendly Policies

There are many ways to support climate-friendly farming on the ground, but reducing the damage of climate change and building climate resilience will require major policy changes. Actions to support farmland conservation, healthy soils, water stewardship, renewable energy, and other sustainable practices. As citizens, we can stand with climate-wise farmers to protect our future by urging our legislators to take action now.

3. TECHNOLOGIES THAT HELP FARMERS RESPOND TO CLIMATE CHANGE

1. No-Till Farming

Avoiding tillage keeps moisture, organic matter and nutrients in the soil, making farm fields more fertile. No-till farming moderates the effects of climate change by preventing soil erosion during floods and slowing water evaporation during years of drought. By reducing tillage, farmers are also reducing their use of fossil fuels since they make fewer passes over the field with farm equipment. The United Nations Environmental Program estimates that no-till farms in the U.S. have helped avoid 241 million metric tons of carbon-dioxide emissions since the 1970s –

equivalent to the annual emissions of about 50 million cars.

2. Heat-Tolerant Traits

With temperatures on the rise due to global warming, heat waves are putting our crops and food security at risk. Plant scientists are evaluating new genetic traits that can boost a crop's heat tolerance. For example, the University of Florida has developed heat-stable traits that showed a yield increase in hot conditions. In their tests, wheat yields increased by 38 percent, rice yields by 23 percent and maize yields by 68 percent.

3. Drought-Tolerant Maize

Drought is the single greatest threat to farms around the world, as agriculture requires more water than any other industry on earth. The Food and Agriculture Organization of the United Nations estimates that by 2025 approximately 480 million people in Africa could be living in areas of water scarcity. To prepare for this challenge, plant scientists are researching drought tolerant traits. For example, the Water-Efficient Maize for Africa (WEMA) project, which brings together public and private sector researchers, is developing ways to double maize yields through conventional and marker-assisted breeding and plant biotechnology.

4. Crop Protection

Climate change is pushing pests and diseases into new geographic areas where they are attacking crops and threatening the global food supply. Up to 40 percent of the world's crops are already lost to insects, diseases and weeds, but without crop protection, these losses would double. Thanks to crop protection products, farmers have continued to increase their yields despite the evolving threat of pests and disease.

5. Nitrogen-Use Efficiency

Nitrogen fertilizers contribute to high crop yields, and it's one way farmers are able to grow more food on existing farmland. However, if too much fertilizer is applied to a field, the excess run-off can find its way into surrounding land and water. To protect the environment and local habitats, plant scientists are developing nitrogen-use efficiency (NUE) traits. This technology will enable farmers to apply less nitrogen fertilizer without sacrificing yields. In a U.S. trial, NUE canola plants grown with just half of the typical application of nitrogen yielded just as high as conventional varieties.

4. CONCLUSIONS

The Climate change poses a growing threat to sustainable development.

The expected effects of climate change could seriously compromise the ability of the agriculture sectors to feed the world, and severely undermine progress towards eradicating hunger, malnutrition and poverty. Action is urgently needed to prepare the agriculture sectors for the prospect of rapidly changing environmental conditions. As the agriculture sectors are partly responsible for the accumulation of greenhouse gas in the atmosphere that are responsible climate change, it is also important to reduce agricultural emission. Even without climate change world agriculture and food security are face daunting challenges.

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