

ADOPTION OF DIFFERENT CROP VARIETIES TO PROTECT BIODIVERSITY WHILE ADAPTING TO CLIMATE CHANGE

Presenter

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Description

Bhutan has been witnessing series of climate change impacts, such as

1. Melting of glaciers at an alarming pace.
2. Erosion of fertile land caused by floods due to incessant rainfall and Glacial Lake Outburst Floods (GLOFs).
3. Erratic rainfalls causing landslides.
4. Extreme weather, such as hail and windstorms, which destroys the flower buds of the fruit trees and shatters them, rendering the tree branches barren

Field evidences have also shown that shifts in cropping pattern are taking place across agroecologies, thus indicating that farming in Bhutan is quite stressed. Farmers suffer crop loss and crop damage due to unusual epidemics that have appeared as a result of changes in weather conditions. Extreme weather events such as untimely rains, droughts, and windstorms have great consequences on irrigation systems, as water is drying up or shrinking compared to the past. Paddy fields often remain uncultivated due to insufficient water availability. Statistics also show apple and mandarin production have started to decline, which could be attributed to biotic and abiotic stresses.

Specifically, COVID-19 has further compromised an already burdensome picture with the increase of agricultural input costs and consequent rise in production costs. There has also been a complicated market access due to closed borders followed by a deterioration of agricultural products caused by forced closures and restrictions.

Farmers reacted quickly and have implemented and adopted several measures to ensure that their production does not suffer from the devastating effects of climate change. These include

- The promotion of modern high-yield crop varieties through technologies. This strategy is one of the short-term measures supported by the government to adapt to the impacts of climate change.
- The cultivation of varieties that can tolerate both biotic and abiotic stresses.
- With the monsoon becoming more erratic and given the short growing season for Bhutan, short duration crop varieties have been adopted, sustainable land management technologies such as hedgerow plantation or fodder tree plantation at the periphery of the field.
- Irrigation schemes and improved drinking water connectivity.
- Adoption of biogas plants and manure briquettes.
- Improved grazing techniques and adoption of winter fodder production.
- Reforestation programmes with climate-resilient plantations.



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Combined with these solutions comes the need to improve the weather information and forecasting system in order to avoid crop losses resulting from extreme weather events.

Finally, the Department of Agriculture, in close coordination with the Department of Disaster Management, should develop a robust sustainable crop insurance policy and contingency plans to protect farmers during disasters.

Results

1. Areas which were considered high altitude and lacking productivity are being harvested with different varieties of vegetables, thereby increasing self-sufficiency, and improving livelihoods.
2. Farmers have other sources of income (vegetable cultivation) rather than depending only on livestock production, as in the past (especially for the highlanders).
3. Less stress on pasture lands and forests due to fodder cultivation.
4. Reduced conflicts and more coordination in the community due to improved irrigation facilities. Earlier farmers had to watch over water sources during rice plantations and many conflicts arose.
5. Increased income source for the farmers.
6. Improved diet variety.

Climate smartness

An integrated approach through the implementation of sets of CSA practices to address climate change impacts is key to ensure and improve farmers' livelihoods. The practices implemented in this case are a clear example of food and nutritional security, particularly in high-altitude areas where the harvesting of diverse range of vegetables increase farmers' self-sufficiency and diversifies their diets and income sources by reducing the dependence on livestock production only. The adoption of high-yielding, short-cycle and stress-tolerant varieties are at the frontline of short-terms strategies that farmers can implement to avoid crop failure or reduced yields, while represent an escape to challenging climate-related conditions. Adaptation is strengthened when the practices are complemented with irrigation systems, making efficient use of water and maintaining or increasing crop yields. In this case, Nepalese agricultural stakeholders can cooperate to improve weather information systems and forecasting, that are essential for planning adjusted cropping calendars. Additionally sound crop insurance policies and contingency plans supported by the Department of Agriculture in close coordination with the Department of Disaster Management can increase farmers' adaptation capacity. The implementation of biogas plants and manure briquettes along with reforestation programs are directly contributing to reduce GHG emission as alternative energy source and increase carbon capture through the use of woody species respectively.

