How to Protect Our Nutmeg from Climate Change?

A brief from the Integrated Climate ChangeAdaptation Strategies (ICCAS) Programme

Did you know that the nutmeg is the spice tree most at risk to adverse impacts of climate change? It takes 4-6 years until the tree produces fruits and its roots are shallow which can be uprooted easily by stronger wind.

Challenge

As a consequence of the devastating impact of Hurricane Ivan and Emily, many people involved in the nutmeg sector lost their jobs. Ivan destroyed 70% of 555,000 trees and production was reduced to 1/10 of the average outcome between 2002 and 2004. From three nutmeg processing plants, only one remains in operation today and in 2009, only 2,500 of the 6,843 active farmers had remained. Currently, the nutmeg sector is recovering: nutmeg production from July to December 2009 was 40.6 per cent higher than in the same period in 2008. However, due to climate change, nutmeg farmers might be faced with even stronger storms, more frequent flooding and torrential rainfall while at the same time the annual rainfall will decrease. Grenada will be faced with higher annual mean temperature, leading to increased evapotranspiration and risk of crop diseases during wet periods.

How to deal with intense rainfall and tropical storms?

More precipitation and higher wind intensity are a threat to trees with shallow roots like the nutmeg tree since it can uproot easily. Intense rainfall can also lead to roots rotting.

Integrated Agroforestry practice, which means planting crops among trees, so that crops are protected by higher trees and become more resistant to strong winds. Higher trees also produce shade to shorter trees. Options include:

- Windbreaks and shelter belts: trees (e.g. bamboo, French cashew, mango, citrus) are planted in line across the direction of the damaging winds to reduce wind erosion.
- Boundary planting: plant permanent trees around the field boundaries.

Three-year old nutmeg tree

Windbreak

- Trees on erosion control structures: add trees to each structure employed for soil and water conservation such as terraces, grass barriers.
- Soil erosion control structures and practices by contour farming and grass barriers
- Adequate drainage.

Grass barriers in Ludbur

- **Diversified cropping systems** reduce water and wind induced soil erosion, protect water quality and protect growing crops from wind-borne soil particles.
- Strip cropping: Strips are laid out along contour or across the general slope. Strips that require intense cultivation with less protective cover are alternated with grass or legume or other protective crops (e.g. corn).
- Mixed intercropping: Crops with varying resource requirements and growth patterns are selected. Crops are cultivated with no specific pattern under consideration of spatial arrangement of plants, planting rates, maturity date. Nutmeg can be intercropped with cocoa, banana, cloves, coconuts, fruits, root crops, vegetables.

Routine tree management produces short trees which are very resistant to hurricane strength winds. An option is pruning: identify and remove dry branches, working from the top center of the plant to increase the amount of light

How to deal with increasing temperature?

While increasing temperatures lead to carbon dioxide enrichment which would boost productivity of nutmeg trees, water availability might critically limit the growth potential.

Hence:

- Ensure water availability when planting on higher elevations or decide on planting area based on watershed availability.
- Apply agroforestry techniques: Plant crops among higher trees that provide shade for new seedlings and for growing crops like clove.

How to deal with less annual rainfall?

In the near future, less rainfall will mainly be an issue for nutmeg trees in low-lying areas, which are usually drier. In these cases:

- Cultivate long term crops on steep slopes that will ensure minimal soil disturbance and promotes soil and water conservation.
- Maintain a supply of and use mulch (e.g. grass or coconut shell, compost) that will conserve moisture and inhibits weed growth: put mulch around the plant 2-4 times the hole's diameter and about 3- inches depth.
- Harvest rain water, construct cisterns and farm dams.
- Establish irrigation system and farm dams.

Let's Keep the Spice in the "Isle of Spice"

Grenada Adapts to Climate Change. Now!

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