

# An Approach to Soil Rehabilitation and Carbon Sequestration in India



### Introduction

A land-based development programme was initiated in the state of Gujarat in India in the mid-1980s with tree-based farming as the basic component. A recent study on 15-year old fruit trees in these systems showed that the carbon sequestered by them is 9.1 t ha <sup>-1</sup> of organic carbon. Twice as much organic carbon was stored by the forestry species which were used as live fencing in the system. As this volume of organic carbon was accumulated on highly degraded soil, a long-term experiment is being conducted to precisely estimate the soil fertility restoration potential through sustainable agricultural practices that focus on organic matter incorporation. Preliminary findings of this study are presented in this poster.

#### **Objectives**

- Increase soil organic carbon by regular green manure incorporation and other organic inputs
- Introduce measures to increase moisture retention capacity and reduce nutrient leaching
- Increase soil fertility through the use of sustainable farming practices

## Methodology

- Raising and incorporating green manure crops such as Crotalaria juncea and Sesbania bispinosa for increasing soil carbon
- Mulching with waste biomass to enhance soil moisture retention
- Use of biological inputs for pest control



- Microbial inoculation to accelerate biomass decomposition
- Tree-based farming to promote biomass production and nutrient recycling

## **Preliminary Findings**

- Approximately 81 t ha <sup>-1</sup> of biomass was incorporated into the soil in four years.
- Increase of soil carbon from 0.42 to 0.60 % was observed in four years. This probably resulted in increase in soil moisture retention, leading to increased crop growth and yield.
- Soil N, P, K levels fluctuated during the study period as shown in the



figures.

• Copper and Zinc levels in the soil improved.

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