World Agroforestry Centre

ICRAF Vietnam | 2016

World Agroforestry Centre

RESEARCH

Generating knowledge
and solutions for agriculture,
tree cover, climate change,
and policy

TRANSFORMS

Strategically integrating trees
in agricultural landscapes

LIVELIHOODS

Improving incomes,
food security, nutrition, and
environmental sustainability

Son Tra models are planted on the slopes in Son La province
Photo: ICRAF/La Nguyen

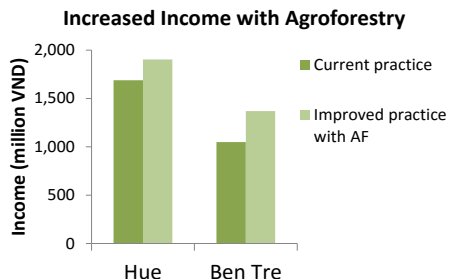# Transforming Lives and Landscapes

Vietnam is among the most vulnerable countries to the effects of climate change. Extreme weather events such as cold and hot spells, drought and flash floods, tornadoes, and typhoons are increasing in intensity and frequency. Severe soil erosion, fertility loss, declining yields, and harsh weather conditions aggravate poverty. Farmers also face poor irrigation capacity, underdeveloped infrastructure, and limited access to financing.

At ICRAF, we seek to improve smallholder farmers' livelihoods through land use options utilizing agroforestry. The integration of trees in landscapes provides ecosystem services for greater resilience, while increasing productivity and incomes. ICRAF is an autonomous, non-profit research and development institution supported by the Consultative Group on International Agricultural Research (CGIAR). This information sheet describes our key findings to date.

Key Findings

INCREASING PRODUCTIVITY & INCOME

Compared to current practice, improved management of agroforestry systems increases income for smallholder farmers. Rubber-cassava systems in Hue province and coconut-cacao in Ben Tre province have increased income by 13% and 30% respectively.

Increased Income with Agroforestry

Studies of tree planted areas, density, and life cycles, have shown that households may earn up to 18.7 million VND from tree planting. Comparatively, households typically incurr negative income from annual crops, due to domestic consumption, and only 7.9 million VND from livestock.

We are helping to realize these benefits for some of the poorest in the country. Our agroforestry trials, intercropping trees and fodder grasses, have already begun to provide benefits even before fruiting seasons. The additional production of fodder grasses diversifies incomes and provides feed for livestock, as well as much needed soil stabilization and water retention on the sloping landscapes. Initial production includes:

Longan, Maize & Fodder Grass
5.7 tons of maize per hectare per crop
6 tons of grass per hectare in the second year
18 tons of grass per hectare in the third year

Shan Tea & Fodder Grass
13 tons of grass per hectare in the second year
34 tons of grass per hectare in the third year

Son Tra & Fodder Grass
63 tons of grass per hectare in the second year
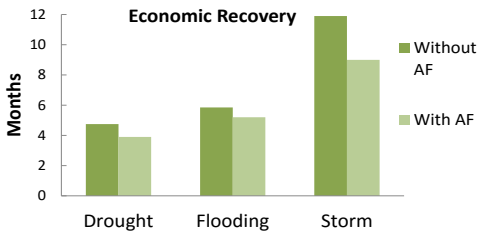
IMPROVING TREE GERMPLASM

We are developing technologies to improve tree germplasm, working closely with farmers to introduce and ensure quality seedlings. In the northwest region, cuttings and grafted seedlings of son tra (*Docynia Indica*) have shown dramatic reduction in the maturing time of trees from 5-7 years to just two years. Grafted seedlings also provide better yield and fruit quality compared to trees grown from seeds.

IMPROVING RESILIENCE

Agroforestry contributes to faster household economic recovery in Ha Tinh and Yen Bai provinces, especially after storm, drought, and flood. This informs the design of climate smart agriculture interventions in the provinces.
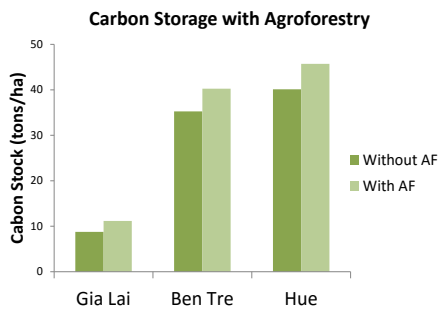

A researcher from ICRAF Vietnam provides germplasm training to a farmer. Photo: ICRAF/Do Hung

Economic Recovery

Months

- Without AF
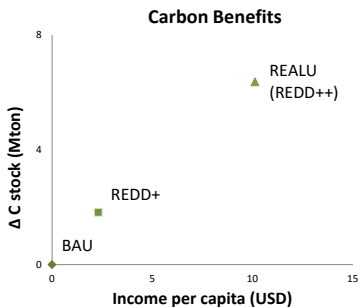- With AF

Drought, Flooding, Storm

Under normal conditions, farmers in Ha Tinh province derive 70% of food, medicines, fuel wood, and other resources from tree-based farming systems. This figure increases to 80% during extreme events such as drought, storms, and big floods, indicating the importance of tree-based systems in adapting to climate variability.

INCREASING CARBON STOCKS

Agroforestry also increases carbon stock. Improved management of agroforestry systems such as rubber-cassava in Hue, litsea-cassava in Gia Lai, and coconut-cacao in Ben Tre provinces increase stocks by 14%, 27%, and 15% respectively.

Carbon Storage with Agroforestry

Cabon Stock (tons/ha)
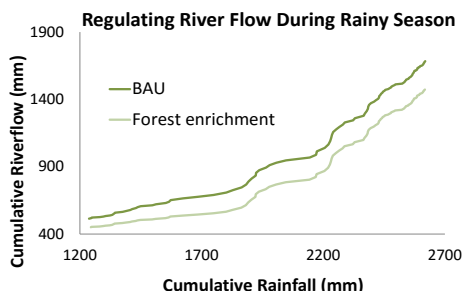
Gia Lai, Ben Tre, Hue

- Without AF
- With AF

In Bac Kan province, a 30-year landscape simulation has shown that planting trees outside forests through agroforestry contributes to overall carbon storage with minimal reduction in income, which can be offset through carbon payments in schemes such as REDD++.

Carbon Benefits

Δ C stock (Mton)

REALU (REDD++)

REDD+

BAU

Income per capita (USD)

REGULATING RIVER FLOW

The Ho Ho watershed in north central Vietnam is experiencing increased flash flooding and drought during rainy and dry seasons, causing crop failure. Planting trees can help regulate river flow. Simulations suggest that protecting and enriching the forest can reduce sedimentation, and flooding intensity by 12.6%.

Regulating River Flow During Rainy Season

Chart axes: Cumulative Riverflow (mm) (y-axis: 400, 900, 1400, 1900); Cumulative Rainfall (mm) (x-axis: 1200, 1700, 2200, 2700). Legend: BAU; Forest enrichment.

ADDRESSING BARRIERS TO TREE PLANTING

Tree planting by farmers in northern Vietnam is constrained by lack of knowledge regarding different tree species, market for timber products, financial capital, limited land, and access to seedlings. We are engaging policy-makers, building the capacity of extension workers and farmer organizations, creating markets for tree products to help address constraints faced by farmers.

GENDER

Gender is a cross-cutting theme across ICRAF's work. We strive to generate understanding of female preferences and needs in land-use to increase gender equity and inclusivity. Studies have shown that women in the northwest and north central provinces prioritize fruit trees for climate change adaptation and income while men prioritize timber trees. Furthermore, women (30 women; 11 men) prefer home garden diversification and intercropping near the house; whereas more men (9 men; 5 women) prefer forestry activities.

H'Mong women in Yen Bai province
Photo: ICRAF/Hamy

To learn more about the 48 agroforestry systems found throughout Vietnam, visit our database at www.scafs.worldagroforestry.org.