Food Security through Conservation Agriculture

SANREM CRSP

Sustainable Agriculture and Natural Resource Management Collaborative Research Support Program

A CAPS program for the Central Plateau of Haiti

After decades of violent conflict and political upheaval, Haiti's agricultural sector is unable to produce enough food for the nation's population of nearly 9 million. The goal of this project is to reduce food insecurity for small-scale farmers in the Central Plateau of Haiti.

Pathways to CAPS in the Andes

Rural populations in the Andean region of South America are frequently dependent on a single food crop -- the potato. The keys to addressing food insecurity in the area are: improving potato yields, reducing yield variability, and introducing companion crops and activities to raise farm families' incomes.

Improving soil quality and crop productivity through CAPS in West Africa

For West African countries such as Ghana and Mali, investment in agriculture is critical to reduce poverty and stimulate economic growth. Improved soil quality and water retention can be achieved through reduced tillage, perennial ground cover, and integrated nutrient, water, and pest management practices.

Developing sustainable CAPS for smallholder farmers in Southern Africa

Subsistence farmers across Southern Africa struggle with food security and often address the shortfall by plowing more land, which results in degraded soils that further limit crop potential. To address these challenges, this project will research the effectiveness of different no-till and tilled crop management systems.

Conservation agriculture for food security in Cambodia and the Philippines

Degraded landscapes are expanding annually in Cambodia and the Philippines, decreasing agricultural productivity, which in turn heightens food insecurity and exacerbates poverty. This project will show how conservation agriculture principles and practices of minimal soil disturbance, continual mulching, and crop rotations can be adapted for local conditions.

CAPS among tribal societies in India and Nepal

Traditional agriculture in tribal and ethnic agricultural societies in India and Nepal is increasingly relegated to less productive land, often on steep slopes. This project will apply a participatory agroecological framework to prioritize local resource use preferences, develop improved conservation practices, and identify market opportunities to enhance livelihood options.

CAPS for smallholder farms in eastern Uganda and western Kenya

Sub-Saharan Africa faces formidable food security and environmental challenges. This project proposes to develop field-scale farming system components through a participatory process that incorporates concepts of co-innovation and co-design among researchers, advisors, and men and women stakeholders in agriculture.

What is CAPS?

The research theme of the SANREM CRSP's current phase is developing conservation agriculture production systems (CAPS). Our research is aimed at increasing smallholders' agricultural productivity and food security through improved cropping systems that contribute to and take advantage of improved soil quality and fertility.

CAPS Principles:

Maintain a year-round soil cover

A permanent soil cover can:

- protect soil from rain, wind, and sun;
- reduce soil erosion, which retains fertile topsoil and prevents silting in rivers and lakes;
- suppress weed growth;
- increase soil fertility and organic matter; and
- increase soil moisture.

Decomposing vegetation and roots from crops make excellent soil cover material. They improve the soil structure, and prevent rainwater from washing soil away.

Minimize soil disturbance caused by tillage

Tillage should be avoided in order to maintain a permanent soil cover. Most traditional farming methods rely on intensive soil tillage, which results in soil degradation. Instead of plowing, farmers are encouraged to drill seeds directly through the soil cover.

Rotate crops

Rotating crops from season to season can help maintain soil fertility. In many conventional farming systems, the same crop is planted in the same field each season, which degrades the soil and increases the number of pests.

Crop residue protects soil from erosion on a field in Mali. The residue will increase soil organic matter and improve soil fertility over time.

Cross-Cutting Research Themes

Each long-term research project collaborates with and contributes to cross-cutting research activities. These activities are designed to identify and organize common research methodologies that will help generalize and expand findings to a wider range of locations and circumstances. The SANREM CRSP currently has four cross-cutting research areas of study:

Gendered Knowledge

This project will identify gender-related factors that contribute to the success or failure of CAPS, and recommend practices that reduce the inequities between men and women.

Economic Impact Analysis

This project will identify field- and farm-level production systems and sequencing of CAPS elements to maximize net benefits to smallholders, minimize risks, and maximize adoption.

Technology Networks

This project examines communication and support networks between farmers and their contacts in the agricultural sector to identify characteristics that enable smallholder CAPS development.

Soil Quality and Carbon Sequestration

This project will measure the changes in soil organic carbon, which has potential for agronomic and environmental benefits. CAPS implementation is expected to increase soil organic carbon.

What is the SANREM CRSP?

The Sustainable Agriculture and Natural Resource Management (SANREM) Collaborative Research Support Program (CRSP) implements multidisciplinary and multi-institutional applied research that:

- mobilizes science and technology;
- fosters innovation and improvement in the social, economic, and environmental sustainability of agriculture and natural resource management;
- leads to improved food production, secure livelihoods, and expanded trade opportunities and capacities for stakeholders.

Research activities are focused on increasing smallholder food security through the introduction of conservation agriculture production systems (CAPS). SANREM CRSP began its Phase IV research on conservation agriculture in Haiti, South America, South and Southeast Asia, and South, West, and East Africa in October 2009 and will continue through September 2014. Seven projects will share $15 million in funding from the United States Agency for International Development (USAID).

USAID FROM THE AMERICAN PEOPLE

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