

A photograph of several cocoa pods hanging from a branch. The pods are in various stages of ripeness, showing colors from green to yellow, orange, and dark brown. A purple banner with the text 'AGRICULTURAL SYSTEMS' is overlaid on the top right of the image.

## AGRICULTURAL SYSTEMS

# Improving food systems around the world

*In today's global society, U.S. land-grant universities are making a difference around the world helping to improve food systems, access, security and education while protecting the environment and helping developing economies grow. When we help foster healthy, well-nourished, economically secure people, we take a major step toward peace in the world.*

### HERE ARE A FEW EXAMPLES OF THAT WORK:

- By teaching Cambodian farmers—mainly women who manage small farms—ways to diversify their operations for improved nutrition and extra income, a project led by **Pennsylvania** researchers and rural sociologists encourages sustainable intensification of underused borderland. The studies produced a list of wild food plants with nutritional and marketplace value, food-plot designs, planting timelines and sustainable farming practices to preserve land for future use. These wild gardens remain productive during the difficult wet- and dry-season food gaps and fortify home food security by combating hidden hunger and deficiencies of vitamins and minerals.
- Many of the world's poorest people live in the rural regions of conflict-affected countries. These people are often trapped in a vicious cycle in which poverty leads to violent conflict, which leads to insufficient investment in agriculture, which in turn leads to poverty. A project led by **Illinois** researchers found that changes in the sea-

sonal precipitation patterns—a move toward wetter wet seasons and drier dry seasons—is harmful for agriculture and exacerbates civil conflict in the Philippines. Analysis shows this effect cannot be explained by psychological or infrastructure-related mechanisms, which suggests that agriculture is important in mediating the effect of climate change on civil conflict. In addition, they generated new evidence that an increase in the value of export crops such as bananas and sugar can lead to an increase in conflict violence and territorial control by nongovernment armed groups. This suggests that a move towards export-oriented agriculture can have unintended adverse effects for fragile and conflict-affected states.

- Following 53 years of civil war, farmers in Colombia face the fallout of enduring rural violence and lawlessness which negatively impacted agricultural investments and growth. Illicit cultivation of crops such as coca (used in cocaine production) and marijuana had either been forced or proved to be the only option for many disadvantaged farmers during the conflict. Plant scientists from **Pennsylvania** are collaborating with teams from **Indiana** and **Florida**

## AGRICULTURAL SYSTEMS

to provide a road map for post-conflict agricultural development that focuses on the production of cacao (used to make chocolate) as an alternative crop that is both profitable and sustainable. The Cacao for Peace initiative brings together this consortium of land-grant universities with technical and economic expertise from a number of governmental agencies from both countries as well as the United Nations. Currently, 35,000 cacao producers across

Colombia cultivate 153,000 hectares of land. In 2015, total cacao production was around 54,000 metric tons, with an average productivity of only 420 kilos per hectare. There is potential to greatly increase both the area under cacao production and cacao productivity through institutional strengthening, cooperative research and Extension education at the center of the Cacao for Peace initiative.

### ABOUT LANDGRANTIMPACTS.ORG

*The Land-Grant University System is a uniquely American institution, and has operated successfully for more than a century. The [landgrantimpacts.org](http://landgrantimpacts.org) website documents and demonstrates the collective and individual impacts of the national system of joint teaching, research, and extension institutions.*

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