homegardens where it is a minor component. In South Sulawesi and Southeast Sulawesi farmers earn IDR 5.0 million (14% of total household income) and IDR 14.5 million (52% of total household income), respectively. The productivity and profitability of smallholder cacao systems has been decreasing over the last 10 years. Yields have plummeted from 1000-1500 kg/ha to 500-700 kg/ha. Discouraged, many farmers want to switch to other commodities, which could have devastating effect on the cacao industry. Key problems with smallholder production are the high incidence of pests and disease, limited access to quality planting material, and the low level farm management. The paper provides analysis and recommendations based on the results of a scoping survey, garden inventory, and group discussion with farmers regarding how to improve the productivity and profitability of smallholder cacao livelihood systems, while maintaining sustainable environmental management.

Keywords: Cacao Agroforestry System (CAS)productivity and profitabilitysmallholder cacaoSulawesi

The business of agroforestry: applying science
The viability of trees as crops: agroforestry, pulp and wood-based enterprises
wca2014-2201

Cocoa agroforestry systems vs. monocultures under conventional and organic management - results from tropical Bolivia

Christian Andres [1,*] Joachim Milz [2] Renate Seidel [3] German Trujillo [2] Freddy Alcon [2] Franco Weibel [1] Monika Schneider [1]
[1]Research Institute of Organic Agriculture (FiBL), Frick, Switzerland, [2]Ecotop Consult, [3]Institute of Ecology, University Mayor San Andres, La Paz, Bolivia, Plurinational State Of

Abstract Content: Cocoa is one of the most important export commodities for many developing countries and provides income for millions of smallholders. The expansion of cocoa production has resulted in habitat destruction, biodiversity loss, and soil degradation. The prevalent cocoa production systems worldwide are conventional monoculture full sun systems. Agroforestry systems are argued to be a viable strategy for sustainable cocoa production. However, data-based information on advantages and limitations of different cocoa production systems is limited. Pairwise comparisons on the long-term performance of cocoa monocultures and agroforestry systems under conventional and organic management are inexistent.
FiBL is pioneering to fill this knowledge gap with a unique long-term field trial in tropical Bolivia established in 2008. The trial consists of six treatments: two monocultures (MONO CONV/ORG) and two agroforestry system (AF CONV/ORG) under conventional and organic management, one organic successional agroforestry system (SAFS) with dynamic shade management, and a fallow of the same age serving as a reference for biodiversity and soil fertility studies. The treatments are representative for current cocoa production systems of smallholders. Parameters regularly assessed include canopy openness, cocoa stem diameter and bean yield, pests and diseases, soil fertility, carbon stocks, economic data and biodiversity.
Five years after planting, results showed significantly shorter tree circumference (18% and 33%) in AF systems and SAFS, respectively, compared to MONO systems. Tree circumference correlated strongly with cocoa bean yield, and highest bean yields were recorded in MONO CONV as expected. Additional products like banana/plantain, cassava, pineapple, etc. were harvested in AF systems and SAFS, which may compensate for lower cocoa yield in the first years. First results indicate that disease incidences were higher in MONO systems compared to AF and SAFS.
Future research will investigate cocoa performance after the establishment phase and thus provide indications on the long-term sustainability of the different systems.

Keywords: AgroforestryCocoaOrganic agricultureSystems comparison

The business of agroforestry: applying science
Biofuels: using trees as a sustainable energy resource
wca2014-1592

A tool for more sustainable fuel use? Carbon finance for cookstoves in India

Olivia Freeman [1,*] Hisham Zerriffi [2]
[1]Institute of Resources, Environment and Sustainability, [2]Liu Institute for Global Issues, University of British Columbia, Vancouver, Canada

Abstract Content: Replacing less efficient traditional cookstoves with improved models of stoves has the potential to create a number of social and environmental benefits. Increased burning efficiency leads to reduced fuel demand, while emissions reductions of particulate matter and climate forcing species lead to both improved health and climate change mitigation. In India the majority of