Background Information

The Umi agroforestry demonstration site was established as an agri-silvicultural system. A combination of trees and cash crops/vegetables were planted in a one-half hectare plot. The aim of this demonstration site is the establishment of an agroforestry system that addresses issues commonly faced by local farmers such as fire control, soil nutrient depletion, weed control, low cocoa yield, availability of different food crops year-round, the availability of fuel wood (firewood), and the provision of house construction materials. The site is located in the Ramu Valley, at coordinates 6°10’54.57”S and 146°10’53.01”E. The species selected for the site were based on a community preference survey, conducted in the Marawasa and Atunas communities.

Demonstration Site Design

The design of the site utilizes three blocks; Block A, Block B, and Block C. Blocks A and C have a primary focus of cocoa production, with a total of 232 Theobroma cacao (cocoa) trees. Both blocks have a border of Manihot sp. (cassava) plants and a border of Musa sp. (banana)/shade trees to act as a buffer against fires. The shade tree species in Block A are Eucalyptus pellita (Eucalyptus), which were selected for their use as a fuelwood and for home construction materials. The shade tree species in Block B is split between Gliricidia sepium (Gliricidia) and Intsia bijuga (Kwila). Gliricidia sepium was selected for its ease of establishment and nitrogen fixing properties. Intsia bijuga is a high-value timber species, but it does not grow well in an open-sun/plantation environment. It was selected to demonstrate that it should not be used as a shade-crop tree, despite the interest in its use by local landowners. The trees in Blocks A and C are intercropped with Cucurbita sp. (pumpkin), Phaseolus sp. (beans), and Sechium edule (choko) to aid in weed control, nitrogen fixation, and the provision of additional crop income.

Block B has a primary focus of agricultural production. The main agricultural crop is Ipomoea batatas (sweet potato), which is grown in a sub-plot with Zea mays (corn). The sweet potato and corn sub-plot is grown at staggered intervals in each of the four corner sub-plots in Block B. The remaining agricultural crops are; Citrullus lanatus (watermelon), Solanum sp. (tomato), Capsicum sp. (chili pepper), Allium fistulosum (spring onion), and Abelmoschus manihot (aibika). Each of these remaining crops has an adjacent sub-plot that lies fallow every other year and is planted with Phaseolus sp. (beans). Block B also incorporates two tree species; Canarium indicum (Galip) for nut production, and Gnetum gnemon (Tulip) to produce leafy greens.
Theobroma cacao (Cocoa) 232
Gnetum gnemon (Tulip) 6
Musa sp. (Banana) 44
Eucalyptus pellita (Eucalyptus) 137
Canarium indicum (Galip) 4
Gliricidia sepium (Gliricidia) 68
Intsia bijuga (Kwila) 69

Cucurbita sp. (Pumpkin) 70
Sechium edule (Choko) 16
Phaseolus sp. (Bean) 97
Abelmoschus manihot (Aibika) 7
Capsicum sp. (Chili pepper) 63
Citrus lanatus (Watermelon) 12