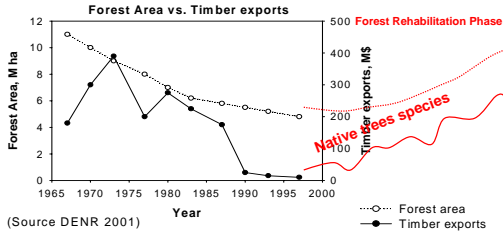
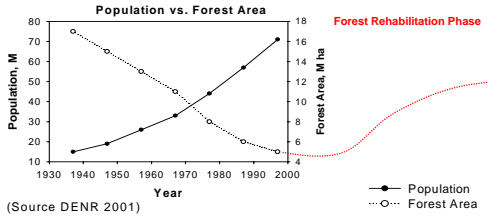
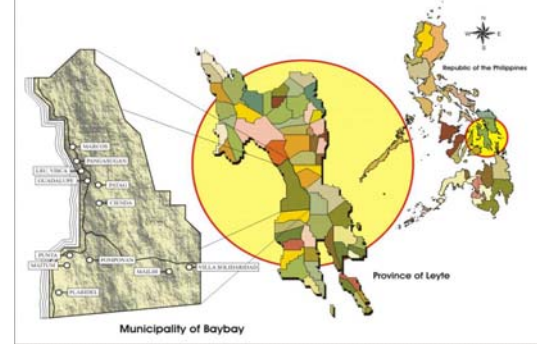


**Overall SAFODS Hypothesis.** "In tree-depleted tropical landscapes with poor soils farming systems purely based on annual food crops are not sustainable, but a transition into tree-based farming is feasible and offers better prospects"



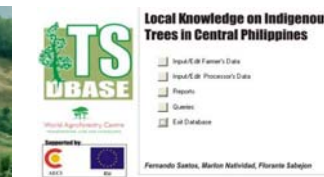
Hypothesis	Objectives
I. The transition into tree-based farming systems has to be gradual and based on farmers priorities. Intercrop systems with local timber trees species will allow for such transition and are compatible with farmers' livelihood strategies;	1. Establish a farmer typology for tree management activities that identifies main <b>Farmers</b> priorities. Intercrop systems with local timber trees species will allow for such transition and are compatible with farmers' livelihood strategies;
II. A quantitative system for tree-by-site matching can be developed to assist farmer-specific choices from an array local trees options;	2. Test a simple set of indicators of suitable site quality that will help to better recognize and utilize landscape niches for selected trees species; stimulation and validation of aboveground biomass and tree architecture of most preferred indigenous timber species will allow and improve model simulation;
III. Tree-soil-crop simulation model allow the generation of a large number of site-specific 'hypotheses' and farm management strategies that allow more rapid progress in on-farm trials	3. Develop a set of biophysical options to test different level labor and capital constraints and management goals.
IV. Farmer's management choices in agroforestry can be assisted by simplified representations of profitability and risk of a wide array of options	4. Develop an improved array of management options for transition years that matches farmers' biophysical options to test different level labor and capital constraints and management goals. 5. Analyze profitability and risk (economical) for realistic farm situations.

## Study Area: Province of Leyte, Central Philippines

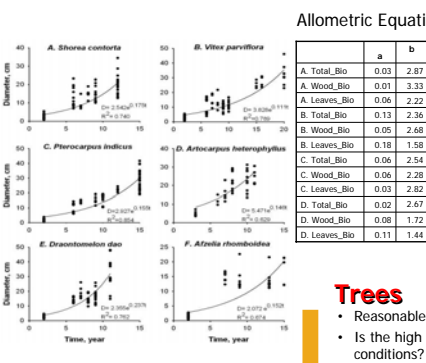


- 149 farmer interviewed
- Data was recorded into 4 layers of information:
  - Site description
  - Demographic and Cultural
  - Household physical resources
  - Economic situation

Tree Species	Number
<i>Shorea contorta</i> , White lauan (Dipterocarpaceae)	132
<i>Vitex parviflora</i> , Molave (Verbenaceae)	143
<i>Pterocarpus indicus</i> , Narra (Fabaceae)	127
<i>Artocarpus heterophyllus</i> , Nangka (Moraceae)	115
<i>Dracontomelon dao</i> , Dao (Anacardiaceae)	85
<i>Azelia rhomboides</i> , Tindalo (Caesalpinaceae)	72



## How fast do these Tree Species grow?



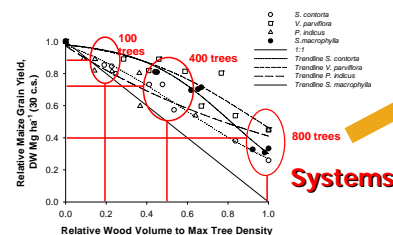
### Trees

- Reasonable tree-growth (i.e. similar to Mahogany)
- Is the high variation of tree-growth due to site conditions?



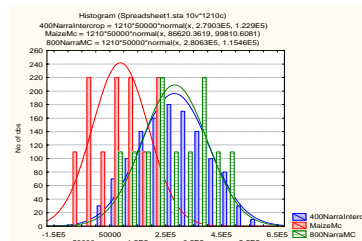
### Farmers

## Tradeoff between tree growth and crop yield



### Systems

## Risk assessment



## Conclusions

- If open-access forest still remains in the area, farmers don't plant timber trees.
- Land tenure, the level of land fragmentation and the total area managed have strong effects on farmers' attitude to plant timber trees. Cultural, demographic, labor availability and economic considerations didn't show a significant effect in the model.
- The three indigenous tree species differ in their growth performance and respond to "site" properties. Four site descriptors (land position, soil type, soil texture and soil chemistry) could account for 14-74% of variation in tree performance depending on the tree species.
- Substantial variation in tree performance could not be explained by the biophysical indicators, implicating that farmers take considerable risk in planting trees on the basis of current 'scientific' knowledge.
- The WanFBA model can be used as non-destructive tool to predicting above-ground tree biomass and its components (Wood and Leaves). The "b" factor of the tree biomass allometric equation has a substantial variation among tree species around the claims of a universal value of 8/3.
- According to WaNuLICAS scenarios there is considerable scope for intercropping with "slow" growing timber trees, with systems that yield about half of the maximum tree biomass still allowing 70% of monoculture maize yield.
- Higher tree densities will lead to a loss of maize yield that is proportional to the gain in wood volume opportunities. Trees directly benefit in an intercrop system from the input (i.e. fertilizer) that are applied to the crops.
- *Pterocarpus indicus* and *Vitex parviflora* stood out as promising "agroforestry" timber tree at intermediate densities. In a non-fertilization scenario intercropping or monocropping systems with Maize are not sustainable.
- Timber-based systems offer better returns to land and labor than monocropping activities, up to discount rates of at least 15%. Intercrop systems are well buffered from economic risk.
- Thus, a gradual transition from an annual food crop system to timber-based production systems adapted to the soil conditions can be attractive for farmers