

## Agriculture **PRINCIPLES** represented on the ECHO Farm

1981 – ECHO started, All areas = 2001, CG = 2010, AT = 2015 PUG = 2021

1. **No silver bullet approach--** many ideas/crops, techniques demonstrated, tested ("the world is a big place."; ARC concept)
2. **Emphasis on diversity--** (Creating multiple food, health, and income possibilities through a dependence on diverse number of species. In general, tropics "boast" diversity; subsistence level farms that reflect this intrinsic quality and potential have far more "safety nets" throughout the year.)
3. **Valuing cultivars and collections of selected species** (unique ECHO perennial collections such as fuelwood, cassava, sweet potato, jackfruit collections, etc. and multiple varieties of annual species -- tomato, cabbage, amaranth, tepary bean, etc.)
4. **Strong dependence on perennials in farming system** (e.g. perennial leaves, fruits, forage, etc.); over 100 cultivated perennial species in 2 ha.(5 acre) global village and over 450 different cultivars campus wide)
5. **Good mix of annual cropping** (no real monocropping evident; 80+ annual species in spring grow-out, more in summer and fall grow-out)
6. **Systems approach to agriculture for small scale farms** (this means diversification and integration-- e.g. SALT system)
7. **Emphasis on extending the growing season** (mulches; dry season crops like pigeon pea, tepary beans; basin gardens; drip irrigation; early, mid, and late maturing fruits; diversity; perennials!)
8. **On-site production of fuelwood and forage** (sustainable systems for on-farm fuelwood production and animal intensification w/ planted forages)
9. **Sound agriculture practices best both for the farmer and the environment** ( i.e. good land care practices = practices good for the farmer, his/her field, and the surrounding environment-- rivers, hillsides, etc.)
10. **Incorporating animals in the farming system without them ruling the landscape** ("most sustainable farming systems will likely have animals involved" Arthur Levine, previous farm manager)
11. **Promoting resources, options, crops for every climate and season** (e.g. global village layout with climate being the main determination between settings; "perennials reveal climate; annuals reveal weather")
12. **Beauty** (colors, spices, diversity, purposefully showcasing the beauty of creation)
13. **Multi-storied agriculture** (planting trees, shrubs, field crops in deliberate patterns that occupy different heights and appropriate sunlight levels-- e.g. agroforestry in rainforest, Victor Wynne method on mountain with lychees, mandarins, bananas, and forage peanut)

## Agriculture **PRACTICES** on the ECHO Farm

- A. **Keep the soil covered**  
(mulches, crop residues, cover crops, crops/tree canopies)
  
- B. **Maximize soil organic matter**  
(i.e. those practices that increase SOM; therefore, burning or tillage rarely practiced)
  
- C. **Incorporate additional organic amendments when possible/available**  
(manure, compost, worm compost)
  
- D. **Minimize soil disturbance**  
(no-till garden beds, FGW plot, fallows with gm/cc's)
  
- E. **Rotate crops**  
(rarely plant crops back-to-back or similar types)
  
- F. **Use "soft" chemical and pest controls when possible**  
( e.g. oil, soap, Bt, homemade recipes, fire ant hormone treatment, glyphosate, beneficial predators, trap crops)
  
- G. **Utilizing legume trees and green manure/ cover crops when possible in rotation or fallow**  
(SALT rows, gliricidia in rainforest, pigeon peas in FGW plot, wood lots, cover crop demonstration)
  
- H. **Small-scale experimentation**  
(variety and observation trials, experiments with soil amendments, underutilized crops, etc.)