The notion of type
Describe a house

- Bedrooms, living room, dining room, kitchen...... (system as used by people)
- HVAC
- Plumbing
- Electrical
- Structural

Different types of descriptions of the same physical object.
Different types of descriptions of the campus as a system
Education System Diagram

- Inputs
- Admin
- Faculty
- Students
- Staff
- Materials

Outputs
- Decisions
- Budgeting
- Research
- Teaching
- Knowledge
- Expertise
- Future Teaching & Research
- Research Appraoch Knowledge
- Attitudes, Opinion, University Image
- Graduates, Skills, Society
- Wages, Community
- Smooth Operation of Departments
- Lab Chemicals, Water, Paper, Computers
- Wastes, Contaminants

Bills, Wages

Return
Admin/Staff/Office

Inputs
- Federal Revenue
- Business, donations etc.

Staff/people (traffic flows)

Outputs
- Decision making
  - Budgeting
  - Various allocations

- Faculty's research
  - Sub-departments

- Staff/people (traffic flows)

Various tasks and responsibilities

Decisions made: policies, courses, records, scheduling, budgeting, accounting, purchasing, etc.
Campus Buildings
Maintenance System Diagram

**Inputs**
- Admin. 
- Staff
- Electricity
- Gas
- Water
- Traffic Flows
- Materials

**Outputs**
- Budgeting Decisions
- Wages Bills
- Office Supplies
- Staff, Trees
- Energy Functional
- Comfort
- Pollution
- $ Saved

**Internal Servings**
- Heating
- Internal Servings
- Internal Servings

**Soundings**
- Sound Buildings
- Sound Buildings

**External Servings**
- Effluent
- Sewage
- Chemical

**Effluents**
- Contaminants
- Contaminants
- Contaminants
Food Services
Synthesis into an overall system description
What's missing?
- Graphics Services
- Bookstore
- Campus Rec…….
Farm as a system

- A social system (family and neighbours)
- An economic system (dollars and cents)
- A food production system (yield)
- An ecological system (species in a community)

Research into sustainability must examine a farm from each of these perspectives.
Types of ecosystem descriptions
Different *types* of descriptions

- Different windows on the world, different framings
- Different perspectives
- Understanding comes from multiple perspectives
- There is no right perspective
- Failure to examine a situation from different perspectives is at the root of many environmental issues.
Elements of a system description

- Components
- Structure
- Boundaries
- Environment
- Scale
- Type
- Nesting
- Hierarchical description