- Regenerative systems go beyond just staying the course as in a sustainable approach. In this model we regenerate the Earth with every action. "Wastewater" becomes a resource that grows plants. It is not just a closed loop but also a feedback loop that generates better soils with every year. If waste is not usable in this way it is replaced with something that is.
- Facilitate the transition of Yucatan to a regenerative economy.
- Establish world-class infrastructure for conducting quality scientific research with social relevance.
- Magnetize investment in eco-research, eco-technology and eco-innovation.
- Generation, Attraction and Retention of Talent.
- Generate Strategic Infrastructure for the region.
- Open Source knowledge sharing.
- Entrepreneurship.
- Demonstrate, trial and model.

Potential Research Projects

1. Carbon Sequestration

- Each tree species - allometrics
- Entire community
- Over time
- With different treatments – biochar, manure, none, soil fungi

2. Change in restored forest with management activities

- Light
- Biomass
- Moisture
- Soil organic matter
- Biodiversity
- pH and soil chemistry

3. Biodiversity Studies

- Baseline inventories
- Birds
- Reptiles
- Plants
- Mammals
- Fishes
- Insects, Arachnida
- Fungi
- Soil organisms
- Change over time and with restoration techniques

- Cenote ecosystem
- Forest ecosystem

4. Ecological Restoration Techniques

- Direct seeding
- Planting techniques
- Soil preparation techniques
- Biochar
- Manure
- Micorrhizae
- Planting density
- Management techniques

5. Nursery propagation techniques for native trees

- Simple fast and easy
- Need full diversity not just the valued species for ecosystem resilience

6. Food Forest

- Production techniques
- Species mix, light levels, trophic levels

7. Behavioral Studies –

- Birds, mammals, insects
- Habitat utilization
- Changes in behaviour

8. Water Quality

- Cenote ecosystem

9. Permaculture

- vs conventional agriculture
- Biochar
- Planting techniques
- Alternative disease and insect control
- Productivity comparisons

10. Biomimicry

Using nature as a model for innovation

11. Bio-engineering

12. Eco-pools

13. Eco-building techniques

14. Alternative energy

15. **Biofilters**

16. **Electricity generation – solar, wind….**

17. **Biodigester**

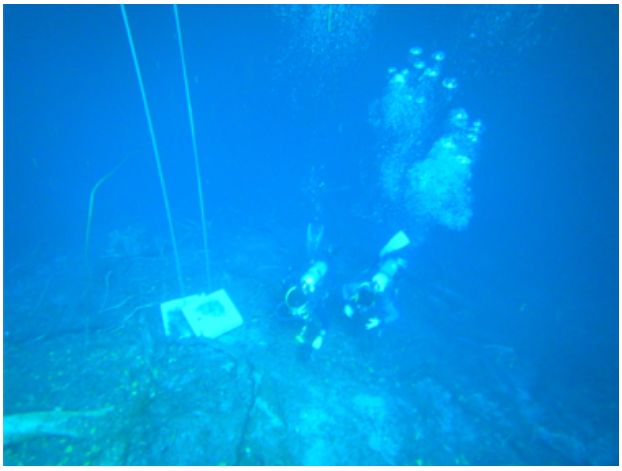
18. **Materials Recycling – Plastics, Metal**

19. **Poverty alleviation**

20. **Microloans and small business development**

21. **Efficient stoves**

22. **Innovation**
    Eco-design
    Eco-alternatives to conventional materials
    Biomimicry



For example, we need to create or test a household sized biochar stove that:

1. Uses less wood or agricultural waste so that less trees are cut,
2. Produces low emissions to reduce lung problems in the local villages,
3. Produces carbon as a byproduct to create biochar for soil enhancement and carbon recapture,
4. Has to be inexpensive and easy to build out of local materials,
5. Has to be better than what the villagers currently use to be implemented.