How to achieve sustainable farming in Kenya?

- Solution Concepts Analysis:
  - **Glass (Matej Marjanovic)**

Glass is an abundant material that is highly recyclable and once produced it has virtually no negative effects on the environment. Manufacturing glass panels for the use of greenhouse glazing, however, requires a lot of energy and it quickly becomes very costly and technologically demanding. Furthermore, due to its fragile nature glass is difficult to transport and this is a relevant issue in Kenya where there are not many well maintained roads to rural areas. Assembly involving glass is as well a difficult process. Flat panel glass that is being replaced on older buildings could be directly re-purposed for greenhouse glazing. This would be a very inexpensive resource, however a somewhat highly skilled workforce would be needed to convert the glass to be used on greenhouses.

  - **Pros:**
    - Great transmissivity
    - No diffusion
    - Highly durable
    - 10+ years lifespan
    - Highly recyclable
  - **Cons:**
    - Very Costly
    - Difficult to transport
    - Harder to assemble
    - Heavy material

- **Poly-film (Chase Schell)**

Currently the cheapest manufactured material we have found coming in at approx. .09$ per sq ft. Most effective film to use in greenhouses because it lets visible light into the greenhouse, and repels harmful radiation from the sun. The problem with using this film, is because our competitors are the main manufacturer of this. Meaning that our supply can be cut off, or the price of the film could be increased. If we could find a way to manufactur this in Kenya then we would have an effective use of this resource. But until then we will have to find a new cheaper alternative.

  - Cheaper, but still too expensive
  - Great transmissivity
  - No diffusion
  - Easy to transport
  - Easy to assemble
  - Light material
  - 6-8 years lifespan
o Frost Cloth (polypropylene spun bonded non woven cloth)  (Ahmed Aldhaheri)

Quick and easy plant protection! The fabric is light enough to lay directly on most plants or vegetables, and it provides good protection against insects and shrubs from the cold. Frost Blankets are put directly over shrubs and plants for freeze or frost protection, creating a layer that traps in the ground heat. All sides of the frost blanket must be sealed to keep the freezing temperatures outside. Protection goes on and comes off quickly and easily.

Pros:
- Cheap material
- Less transmissive
- Light is diffused
- Easy to transport
- Easy to assemble

Cons:
- Short lifespan (UV degredation)

o Naturally obtained, or grown materials  (Michael Sykes)

Natural materials represent a cheap, sustainable option that can be obtained fairly easily. If vines were grown on a structure, like a trellis, that hung over the crops in the greenhouse, I believe the right kind of growing environment could be attained. Some maintenance would be required to produce the optimal growing climate inside the greenhouse. Some drawbacks would be the time it would take to grow the vines over the structure, and needing to fine tune and maintain each greenhouse to ensure the proper growing environment.

Pros:
- Cheap
- Biodegradable
- Low-impact on environment
- Easily acquired
- Very sustainable=longevity
- Transmissivity could be adjusted with pruning

Cons:
- Time required to grow vines
- Trials needed to obtain optimal greenhouse climate
- Additions needed on structure
- Some light diffusion due to vine leaves