

# Permaculture Design

APRIL 30, 2020



# Presentation Overview

#### I. Design Goals

- 1. <u>Animals</u>
- 2. Irrigation
- 3. <u>Energy</u>
- 4. <u>Human Food</u>
- 5. <u>Waste</u>
- 6. <u>Community Empowerment</u>
- 7. <u>Community Mission</u>
- 8. <u>Destination</u>
- 9. <u>Abundance</u>
- II. The Design
  - 1. <u>Sector Map</u>
  - 2. <u>Water Design</u>
  - 3. <u>Access Design</u>
  - 4. <u>Structure Design</u>
  - 5. <u>W.A.S. Design</u>
  - 6. <u>Zone Design</u>
  - 7. <u>Living Species Design</u>
  - 8. <u>Mobile App Design</u>

#### III. Financial Models for the Design

- 1. <u>Summary of Financial Benefits of Design</u>
- 2. <u>Animal Food & Water Model</u>
- 3. Irrigation Mode
- 4. <u>Solar Energy Model</u>
- 5. <u>Biogas Energy Model</u>
- 6. <u>Farm-to-Table Mode</u>
- 7. <u>Children's Garden Model</u>
- 3. <u>Mobile App Model</u>
- 9. <u>Cannabis Farm Model</u>
- IV. Next Steps
- v. Exhibits



#### Section I DESIGN GOALS



#### Goal 1: Animal Autonomy

100% of the food and water required by the farm animals is supplied efficiently by the property with no external dependencies.



### Goal 2: Irrigation Autonomy

100% of the water required by the plants is supplied efficiently by the property with no external dependencies.



#### Goal 3: Energy Autonomy

100% of the electricity and flammable gas required by the property is supplied by the property with no external dependencies and energy becomes a source of revenue rather than cost.



#### Goal 4: Authentic Farm-to-Table Experience

At least 50% of the food served or sold to humans is grown at the property.

"



#### Goal 5: Approach Zero Waste

Waste is reduced to less than 10% of its current level and the large trash container is replaced with additional parking spots.



#### Goal 6: Empower the Community

Marando Farms becomes a thriving hub for teaching children and their families about nature and sustainability.



#### Goal 7: Community on a Mission

The local community becomes the primary source of labor required to achieve these goals and maintain the property for generations.



#### Goal 8: A National Destination

Marando Farms becomes a national destination, popularized by a mobile app that guides the whole experience for all, from first-time visitors to daily volunteers.



#### Goal 9: Abundance

Generate more money and energy than the property and the Marando family require to run the business without stress and to enjoy a high quality of life in harmony with nature.



#### Section II THE DESIGN



Permaculture Design Project

\*

 $\overline{\ }$ 

# Rever foots Ogle Earth Project

| Ø  | Property Boundary                  | Ŕ      |
|----|------------------------------------|--------|
| 1  | Aquaculture Pond for Fishing       | Ŕ      |
| 17 | Existing Water Pump for Irrigation | from P |

- 式 Front Swale
- Existing Underground Pipes for Irrigation
- 式 Gutters for Main House
- 🟥 1,000g Rainwater Tank from Main House
- Solution Pipe to Level Water between Both Tanks
- 🔁 Pavilion Rainwater Gutter (North)
- 🔁 Pavilion Rainwater Gutter (South)
- Pipe from Pavilion Gutters to Tank
- 1,000g Rainwater Tank from Pavilion
- 🛰 Irrigation for NE
- : Underground Pipe for Pond
- 🔁 Aquaculture Pond for Growing
- Tree Island (979 ft<sup>2</sup> area)
- 🔀 Water Line for Chinapas
- 🔣 Water Line for Drip Irrigation

© 2020 PERMACULTURE

- 🐝 Drip Line 1
- 🛰 🛛 Drip Line 2
- 🛰 Drip Line 3
- 🔣 Chinampa 1
- 🕂 Chinampa 2
- 💢 Chinampa 3
- 🔼 Chinampa 4

# Sector Map





# Sector Map & Site Observations

- With such broad sun angles (248 mid-winter to 290 mid-summer) there are great opportunities to generate electricity from solar gain as well as to enjoy long growing seasons, however, solar elevation of over 70 degrees for 3-4 hours a day requires strategies for shading plants, animals, and humans.
- Strong easterly winds in Jan, Feb, and August as well as hurricane season (Jun to Nov) require strategies for creating windbreaks to protect plants, animals, and humans.
- Flooding is a problem during the wet season with several known flood areas. This creates opportunities for slowing, directing, and storing water.
- Soil is mostly loam and sand with very limited clay content which presents challenges for retaining moisture and nutrients as well as for constructing damns and ponds.
- Soil pH samples ranged from 7.2 to 7.8 with an average of 7.5. This higher alkalinity is favorable for some species but other species that prefer a pH below 7 may require soil treatments to lower the pH.



# Water Design





# **Example of Chinampas**



# Water Design Overview

- Build a winding swale at NE area of property to prevent flooding in wet season and naturally irrigate the land to be used as the community garden.
- Large pond south of Main House will be used to establish aquaculture production of fish and seafood for the farmto-table restaurant. It will also continue to be used to irrigate hoop house area.
- Catch rainwater from Main House and Pavilion and direct gutter angles to NW corner of Main House and SW corner of Pavilion where 1,000+ gallon cisterns are each located. Cisterns linked with a pipe at their bottom to consolidate storage capacity will supply water for the community garden area and for the small aquaculture pond to the west of the Pavilion via a 6" underground pipe. Details provided in Irrigation Model.
- Small aquaculture pond will provide drip-line irrigation for the growing area to its west as well as supply water for eight chinampas to its south.
- Small aquaculture pond will produce seafood for restaurant and koi carp fish for high-ticket sales as pets. Eighth chinampa has drainage pipe to canal for overflow of chinampas or small pond.
- Catch rain on Children's Garden roof and store in cistern at top of hill, feeding drainage pipe that supplies water for five ponds that animals drink from. Details provided in <u>Animal Food & Water Model</u>.
- Swales surrounding hill slow and direct water to improve irrigation of growing area and also feed drainage pipe to animal drinking ponds. Drainage pipe should be a 4" pipe to have enough capacity to handle the maximum 24 hour rainfall of 14.59" over a catchment volume of approximately 11,000 cubic feet.
- > Drinking pond for horses and bull has overflow pipe that provides irrigation to the fruit tree forest to its east.



# Access Design





# Access Design Overview

- Convert some underutilized areas in the parking lot into parking spots for increased customer capacity.
- Add powered gates with doors at two important junctures (one West of the Main House and one West of the Pavilion) so that people have to go through the Main House to appreciate the view or through the Pavilion to access the rest of the property for the mobile app experience. Details provided in <u>Mobile App Model</u>.
- Create a doorway at the West end of the Pavilion as the main entry/exit point for customers for the rest of the property.
- Add a wall at the NW corner of the pavilion so that customers cannot enter the rest of the farm.
- Create compacted dirt-clay mounds on two areas of the road on the North of the property that tend to flood in the wet season.
- Remove a light structure that impedes access on the road just West of the main house.
- Narrow and more clearly define the road route north of Zone 3 to allow the swales to control water that tends to flood near there, so that it is more clear for vehicle drivers where to drive there, and to make the area safer for children who may be playing around the Children's Garden.
- Remove a manual-push/pull gate along the road at the North of the property to facilitate unimpeded access to the Children's Garden and Playground.
- Reinforce the wall along the West side of the hog pens so that neither hog can get out into the animal food growing zone or anywhere near the Children's Garden for the safety of the children.
- Add a wheel to the gate on the road at the South of the property near the area for the donkeys, pigs, and chickens so that it can be opened/closed more efficiently.



## Structure Design





# Structure Design Overview

- Construct a dock for better access to the large aquaculture pond.
- Install 121 solar panels mounted on the south-facing roof of the Main House generating 9,500 KWH of electricity per month on average. Install 153 solar panels mounted on the south-facing roof of the Main House generating 12,000 KWH of electricity per month on average. Details provided in <u>Solar Energy Model</u>.
- Renovate the large shed SW of the Main House so that it can be used as a storage and work area, primarily for the chinampas and small aquaculture pond.
- Convert the 40 ft storage container "barn" into a set of dry compost toilets with eastern aspect to address the limitations of the current septic tank and single toilet for the public.
- Remove the Petting Zoo, Stables, and fence surrounding the Stables, consolidating all of the farm animals in the central, forested area of the farm where there is natural shade, cover, and limited growing potential for edible foods. This area will be replaced with 8 chinampas as a growing area most often used as ingredients by the kitchen nearby.
- Remove the fence surrounding the well north of the Petting Zoo and sealing and filling the well that is currently there to prepare the area for an aquaculture pond.
- Build a welcome desk for the farm experience mobile app at the West side for the Pavilion which will serve as the single access point for exploring the rest of the farm.



# Structure Design Overview (continued)

- An area will be cleared and leveled for compost heaps in the center of the property at the south side of the growing area next to the nursery.
- Install a biodigester and gas compressor in the horses and bull area to convert collectible manure from all of the farm animal areas into biogas tanks that will be used as the source of flammable gas for the outdoor kitchen area in the Pavilion. Details provided in <u>Biogas Energy Model</u>.
- Add some natural structures that harmonize with the nearby trees in each of the animal areas using recycled and re-purposed materials to provide more shelter for them.
- The shed at the West of the property needs a new roof and floor. It can be used to accommodate a volunteer and/or to store implements for the adjacent growing area.
- Build a Children's Garden and Playground on the hill at the West of the property that are designed by the children already in the Marando Farms community. Structures will be built from at least 50% recycled or reclaimed materials, hurricane resistant, temperature-regulated from geothermal, convection, shading, and other passive techniques, powered by solar panels mounted on the roof, and catch rainwater used to supply some of the drinking water for the farm animals. There will be a comfortable indoor-outdoor space for children to learn about nature through a play-based, self-directed approach to learning with no set curriculum. Details provided in <u>Children's Garden Model</u>.
- If licensing can be acquired in partnership with the Town of Davie, installing a "Freight Farm" (freightfarms.com) north of the hog pens with eastern aspect to reliably grow approximately 1 lb. of medical marijuana per day with a consistent quality using rainwater and solar power for self-sustainability with minimal operating costs and very high sales margins. Details provided in <u>Cannabis Farm Model</u>.



# W.A.S. Overview Design





## Zone Design





#### Zone 0 Overview



- Zone 0 is where there is almost non-stop activity and use. Key features of the design in Zone 0 include:
- Increasing the available parking spots to accommodate a larger customer base
- Installing solar panels on the south-facing roof. Combined with the solar-generated electricity from the Pavilion roof, there will be more than enough electricity to supply all of the property's electricity requirements and revenue can be generated from selling surpluses.
- Modifying the gutters so that the rainwater is directed to a 1,000 gallon cistern at the NW corner of the Main House. This water will be combined with the rainwater caught from the Pavilion roof to irrigate the growing area to the NE of the Main House as well as to supply the water for an aquaculture pond and linked chinampas and growing systems to the West of the Main House.
- Synchronizing the menu of the restaurant and smoothie bar as well as the product offering in the grocery to harmonize with the cycles of what the farm is growing to provide an authentic farm-to-table experience where at least 50% of the food served and sold is produced by the farm.
- Converting the 40 ft storage container currently used to store animal food into dry compost toilets to address the septic tank overflow and single-bathroom for all problems, while enabling that waste to be used by the farm for growing.



Installing a gate at the SW corner of the Main House to restrict access to the areas of the property west of the Main House to only those who pay for access through the mobile app to be developed.

## Zone 1 Overview



- Zone 1 comprises the Pavilion, the most frequently visited part of the Human Food Growing Area, the Children's Garden and Playground, and the lanes running alongside the farm animals.
- ► Key features include:
- The Pavilion will continue to serve as cooking area for the restaurant and a venue for events. A welcome center desk will be built at its west side to control serve as the single entry/exit point for customers of the Children's Garden and/or mobile app experience of the rest of the property.
- Solar panels will be installed on the south-facing roof as previously indicated.
- **•** Gutters will be modified and augmented to direct rainwater to the SW corner of the Pavilion as previously indicated.
- An underground pipe will be installed to direct the rainwater from the Pavilion and Main House cisterns to fill and replenish the water for a crenelated aquaculture pond that has an island with trees in its center.
- Earthworks will be required to form the aquaculture pond and connected chinampas using clay-rich soil as the property's soil lacks clay content. The intent of this layout is to visually attract people who visit the Main House with the beauty of the most productive and abundant growing systems known to humanity while also locating a significant volume of the Main House's food inputs in close proximity. This should increase the conversion rate from Main House customers to mobile app customers.
- > The exotic animals center, maintained by a separate organization, will also be a destination for mobile app subscribers.
- Drip-line irrigation will be installed for the currently non-irrigated area to the west of the pond and chinampas using the water from the aquaculture pond as the source.
- The road along the north of the property will provide a pleasant walk to the Children's Garden, passing the abundant growing areas for human food, some of the farm animals, and the growing area for farm animal food. Measures have been taken to reduce or eliminate known flooding areas along this road.
- The lanes running along the farm animal areas will be used very often for Children's Garden and mobile app customers to see the farm animals.
- > The Children's Garden and Playground will be used on a daily basis for various activities.



#### Zone 2 Overview



- > Zone 2 is split across 7 distinct areas that will be used every 1-2 days depending on the season and the maturity of the design:
  - ▶ 1. The NE corner of the property (community garden)
  - ▶ 2. The SE corner of the property (horse grazing and aquaculture pond)
  - ▶ 3. The less-frequented Human Food Growing Area and Food Forest
  - ▶ 4. The Animal Living Area
  - ▶ 5. The Animal Food Growing Area
  - ▶ 6. Self-Sustainable Living Area
  - ► 7. The Cannabis Farming Container
- The current community garden will be relocated to this larger area that is more accessible to the public. Lots can be offered to annual mobile app members.
- This area will provide a secondary food source for the horses and ponies while also creating a visually attractive spectacle for people driving and walking by the property. To the extent necessary, this area may be irrigated using the water from the adjacent pond.
- The large pond in this area was once fished from, however, now the only fish seen there are predatory tarpon which appear to be stuck there with very little stock fish to eat. The pond's ecosystem should be carefully restored by assessing the current state of the pond's bottom, water, species, habitat, and vegetation.
- The western side of the Human Food Growing Area consists of 3.3 hoop house rows that run from the north road to the south road of the property. The middle two hoop houses have a reflective covering draped over them that reduces the amount of sunlight on them. There is a sprinkler system running along the lines where the hoop houses meet except there is no irrigation along the west side of the west hoop house. The uncovered westernmost and eastern-most hoop houses will be used to grow plants that thrive on full sunlight while the middle covered two hoop houses will be used to grow plants that thrive on full sunlight while the middle covered two hoop houses will be used to grow plants that thrive on full sunlight while the middle covered two hoop houses will be used to grow plants that thrive on full sunlight while the middle covered two hoop houses will be used to grow plants that thrive on full sunlight while the middle covered two hoop houses will be used to grow plants that thrive on full sunlight while the middle covered two hoop houses will be used to grow plants that thrive on full sunlight while the middle covered two hoop houses will be used to grow plants that thrive on full sunlight while the middle covered two hoop houses will be used to grow plants that thrive on full sunlight while the middle covered two hoop houses will be used to grow plants that thrive on full sunlight while the middle covered two hoop houses will be used to grow plants that thrive on full sunlight while the middle covered two hoop houses will be used to grow plants that desire less direct sunlight.
- The southern part of the hoop house that is third from the west will continue to be used as a nursery, with the adjacent compositing area for 18-day composit heaps.
  - To the west of these hoop houses there is a row of sago palm trees running north to south and to the west of these lower sago palm trees there will be a Fruit Forest. There are already some tropical trees growing at the south end of this Fruit Forest area. It may take a while before these newly planted and to-be-planted trees yield fruit, but it will be beautiful for community to see them grow, particularly the children.

# Zone 2 Overview (cont.)



- The Farm Animal Living Area are covered with a palm tree canopy of approximately 30 feet in height and organized into the following fenced in areas:
  - ▶ 1. One for the bull and 2 horses in the NE corner of the forested area (currently uninhabited and unproductive)
  - 2. One for the 3 ponies, 2 sheep, 3 goats, 5 turkeys, and 2 tortoises in the SE corner where there is already a coop house for the turkeys (currently uninhabited and unproductive)
  - > 3. One for the 2 donkeys, 7 pigs, and 35+ chickens in the middle of the FALA where there is already 2 coop houses for the chickens
  - 4. One for a 700 lb. hog named Olive in the NW corner
  - ▶ 5. One for a 900 lg. hog named Tiny in the SW corner
- As previously described, each of these areas will have small drinking ponds to supply all of the farm animals with water caught from the rain. Some natural shelters will be created for the NE and SE areas, utilizing the trees as part of the structure to the extent practical. There is a cabin in good condition at the north side of this area that can be occupied by a volunteer. There is another cabin at the south side of this area that is currently being restored to serve as a reptile sanctuary. The fence on the west side of the hog areas must be reinforced to ensure that neither hog can get out. To the extent possible, ground cover will be planted in the Farm Animal Living Area that some of the animals can eat.
- The Animal Food Growing Area is on the only land on the property with any significant contour. Swales are used here to maximize productivity and direct water to the drainage pipe that supplies water to the drinking animal ponds. Carefully-selected ground cover and plants will be grown here and the chopped and fed to the animals as their sole source of food. The SSLA is already complete as a demonstration are to educate people about how affordable, comfortable, and practical it is to live self-sustainably.



The CFC is dependent on licensing and cooperation with the Town of Davie. If successful, the design recommends that the client explore the possibility of a partnership with Freight Farms (freightfarms.com) to obtain one of their fullyautomated farming containers for free or at a discount as a demonstration of how their product can be used to grow medical marijuana.

#### Zone 3 Overview



- Zone 3 only consists of the three small areas that are visited once a month:
  - ▶ 1. the area to the east of the eastern gate of the property along the sidewalk
  - > 2. the strip of land in-between the entry and exit driveways
  - ▶ 3. the rectangular area north of the Pavilion and south of the boundary fence
- The design does not propose any new features or improvements in these areas.



#### Zone 4 Overview



- Zone 4 is as close to the wild as this property gets. It comprises the area south of the large pond, the canal that is south of the south road and fence, the forested area west of the west road and fence up until the canal on the west of the property, and the forested area to north of the north road and fence.
- Zone 4 is where iguanas, ducks, geese, vultures, hawks, snakes, and other wildlife live and flow through. The implementation of the design should attract a broader range of wildlife to the property.
- Although there are some invasive tree species in Zone 4 that may be removed, the design does not propose any significant new features or improvements in these areas.



# Living Species Design: 9 Growing Areas





# Growing Area 1: Community Garden



The community will decide what to grow here with recommendations for native species that can be purchased from the farm.



# Growing Area 2: Grazing Area for Horses & Ponies



- 1. On Fence: Luffa (Luffa aegyptiaca Mill.)
- 2. Outer Perimeter Inside Fence: Sunflower (Helianthus annuus), Echinacea (Echinacea purpurea), Crimson Bottlebrush (Callistemon citrinus)
- 3. Inner Perimeter: Fenugreek (Trigonella foenum-graecum), Calendula (Calendula officinalis)
- 4. Middle Area: Alfalfa (Medicago sativa), Timothy (Phleum pratense), Coyotebrush (Baccharis pilularis)



# Growing Area 3: Large Aquaculture Pond



- 1. Perimeter Trees: Coconut (Cocos nucifera; present), Sugarcane (Saccharum officinarum; present), Papaya (Carica papaya), Banana (Musa acuminata)
- Vines: Purple Passionfruit (Passiflora edulis), Pole Beans (Phaseolus vulgaris 'Blue Lake Pole')
- 3. Perimeter Plants: Water Chestnut (Eleocharis dulcis), Kangkong (Ipomoea aquatica), Taro (Colocasia esculenta), Azolla (Azolla filiculoides)
- 4. Pond Bottom: Mussels (Bivalvia), Crayfish (Cambarus sp), Prawns (Dendrobranchiata)
- 5. Stock Fish: Tilapia (Oreochromis niloticus), Bluegill (Lepomis macrochirus), Yellow Perch (Perca flavescens)
- 6. Predatory Fish: Largemouth Bass (Micropterus salmoides), Barramundi (Lates calcarifer)



# Growing Area 4: Small Aquaculture Pond & Chinampas



- 1. Perimeter Trees for Chinampas: Mango (Mangifera indica), Papaya (Carica papaya), Banana (Musa acuminata)
- 2. Vines: Malabar Spinach (Basella alba), Green Beans (Phaseolus vulgaris 'Blue Lake'), Bougainvillea 'Surprise' (Bougainvillea glabra)
- 3. Perimeter Plants: Wild Rice (Zizania), Kangkong (Ipomoea aquatica), Taro (Colocasia esculenta)
- 4. Pond & Chinampa Bottom: Mussels (Bivalvia), Crayfish (Cambarus sp), Prawns (Dendrobranchiata)



▶ 5. Fish: Minnows, Goldfish (Carassius auratus), Koi Carp (Cyprinus carpio)

# Growing Area 5: Three Sisters & Root Veggies with Drip-Line Irrigation

- 1. Sunflowers (Helianthus) along north fence line
- 2. Three Sisters Guild: Sweet Corn (Zea mays 'Kandy Korn'), Green Beans (Phaseolus vulgaris 'Blue Lake'), Seminole Squash (Cucurbita moschata), Zucchini Squash (Cucurbita pepo), Garlic (Allium sativum), Onion (Allium cepa), Potatoes (Solanum tuberosum), Carrots (Daucus carota subsp. sativus), Beets (Beta vulgaris), Turmeric (Curcuma longa)
- 3. Weed & Pest Barrier: Marigold (Tagetes) between three sisters and with Comfrey (Symphytum) along west perimeter



# Growing Area 6: Hoop Houses & Nursery with Sprinklers

- ▶ 1. Sunflowers (Helianthus) along north fence line
- ▶ 2. Easternmost Hoop House (reflective cover, sprinkle irrigation, 32 6' x 2.5' beds):
  - > 2a. Tomatoes (Lycopersicon) along the Hoops
  - 2b. 16 beds with Arugula (Eruca vesicaria ssp. sativa), Spearmint (Mentha spicata), Thyme (Thymus vulgaris), Rosemary (Salvia rosmarinus), Broccoli (Brassica oleracea var. italica)
  - 2c. 16 beds with Basil (Ocimum basilicum), Chives (Allium schoenoprasum), Oregano (Origanum vulgare), Dill (Anethum graveolens), Cucumber (Cucumis sativus)
  - > 2d. Weeds & Pests Barrier: Diatomaceous Earth
  - > 2e. Nursery (South part of Easternmost Hoop House): Seedlings for whatever required by the growing areas
- **3.** Center Hoop House (reflective covered, sprinkle irrigation, no beds):
  - ▶ 3a. Tomatoes (Lycopersicon) along the hoops
  - 3b. Lettuce (Lactuca sativa), Kale (Brassica oleracea var. sabellica), Mustard Greens (Brassica juncea), Okinawa Spinach (Gynura bicolor), Swiss Chard (Beta vulgaris subsp. vulgaris)
  - ▶ 3c: Weed & Pest Barrier: Marigolds (Tagetes) interplanted
- 4. Westernmost Hoop House (no cover, partially irrigated):
  - ▶ 4a. Green Beans (Phaseolus vulgaris 'Blue Lake') and Sugar Snap Peas (Pisum sativum) along the west hoop
  - 4b. Chickpeas (Cicer arietinum), Bush Beans (Phaseolus vulgaris 'Blue Lake'), Bell Peppers (Capsicum annuum Group), Habanero Peppers (Capsicum chinense Habanero Group), Jalapeno Peppers (Capsicum annuum 'Jalapeño'), Eggplant (Solanum melongena), Watermelon (Citrullus lanatus)
  - ▶ 4c. Weed & Pest Barrier: Comfrey (Symphytum) along west perimeter

), Rosemary (Salvia rosmarinus)



# Growing Area 7: Fruit Forest

- Trees: Avocado (Persea americana), Banana (Musa acuminata), Cashew (Anacardium occidentale), Coconut (Cocos nucifera), Lemon (Citrus limon), Mango (Mangifera indica), Orange (Citrus X sinensis), Papaya (Carica papaya)
- 2. Mushrooms: Chicken of the Woods (Laetiporus sulphureus) grown near tree roots
- 3. Vines: Vanilla (Vanilla planifolia) vines on Banana trees; Purple Passion Fruit (Passiflora edulis) on Lemon, Mango, Orange, and Papaya trees
- Luffa (Luffa aegyptiaca Mill.) along east and south fence lines for horses, bull, ponies, sheep, and goats to eat



# Growing Area 8: Animal Food



- 1. On Swales: Sweet Corn (Zea mays 'Kandy Korn')
- Adjacent to Swales: Alfalfa (Medicago sativa), Oats (Avena sativa), Forage Sorghum (Sorghum bicolor), and Timothy (Phleum pratense)
- 3. On Fence: Luffa (Luffa aegyptiaca Mill.)



# Growing Area 9: Cannabis Container Farm (if approved)



Cannabis (Cannabis sativa)



# Design Considerations

While the design recommends significant modifications, developments, and investments, careful consideration has been given to:

- restrict recommendations to those only critical to the long term social, environmental, and financial success of the property and its stewards
- Imit the costs of implementation by leveraging and repurposing the assets and energy already present on the property as well as its surrounding community
- balance the importance of ecological sustainability with the importance of commercial viability
- allow for design to be implemented at a pace that works for the Marando family
- Given the unique background and existing customer base of Marando Farms as well as the growing demand for sustainability, we believe that the bulk of the costs of the design can be met from sponsors who will benefit from their association with Marando Farms



## Marando Farms App Design



#### Marando Farms App Design

Screen



Farm Adventure

**Adventures** 

Screen



PERMACULTURE SOLUTIONS

#### Section III FINANCIAL MODELS FOR THE DESIGN



# Summary of Financial Benefits of Design

|                          | Inv | estment | Years to Recover Investment | 5  | Year Return (including savings) | Annual Rate of Return |
|--------------------------|-----|---------|-----------------------------|----|---------------------------------|-----------------------|
| Animal Food & Water      | \$  | 12,000  | 1                           | \$ | 80,040                          | 133%                  |
| Solar Energy             | \$  | 175,000 | 6.7                         | \$ | 683,280                         | 78%                   |
| Biogas                   | \$  | 10,000  | 2.7                         | \$ | 18,000                          | 36%                   |
| Farm-to-Table Restaurant | \$  | 15,000  | 1                           | \$ | 655,628                         | 874%                  |
| Children's Garden        | \$  | 50,000  | 1.5                         | \$ | 418,199                         | 167%                  |
| Mobile App               | \$  | 42,400  | 1.8                         | \$ | 801,533                         | 378%                  |
| Cannabis Farm            | \$  | 408,510 | 1.5                         | \$ | 2,332,168                       | 114%                  |
| Total or Average         | \$  | 712,910 | 2.3                         | \$ | 4,988,848                       | 254%                  |



# Animal Food & Water Model

- Properly feeding, watering, and cleaning for the farm animals currently takes approximately 130 hours per month of labor. Although this is often volunteer labor, this labor could be more productively used elsewhere.
- The is a good example of the property's "Chicken-and-the-Egg Problem": due to financial constraints, labor is typically allocated to short-term, revenue-generating priorities and not to making significant improvements to overall productivity, so labor productivity remains low, reinforcing the financial constraints
- Approximately \$1,334 per month is spent on feeding, watering, and cleaning:
  - Approximately \$1,304 per month is spent on animal foods
  - Approximately \$20 per month is spent on city water for the animals
  - > Approximately \$10 per month is spent on gasoline to drive the food and water to the animals in the back
- The Petting Zoo does not generate enough revenue to cover these costs
- The design reduces the monthly animal food and water costs to \$0 while still generating revenue for access to see the farm animals from the mobile app
- ▶ The design should reduce the labor costs of feeding, watering, and cleaning the animals by at least 50% because:
  - > The animals will drink water from their water ponds whenever they want without manual intervention
  - The animals can graze for some of their food and the rest of their foods will grow adjacent to them for an efficient chop and feed process
  - > The animals will not require much cleaning since their waste will either fertilize the soil or be used to generate biogas
  - Estimated costs of \$10k



Details provided in Exhibit A

# Irrigation Model

- Approximately 52 hours per month of labor is spent on watering the areas of the property lacking irrigation
- Approximately \$15 per month is spent on fuel for the water truck and the generator used to pump water
- The design achieves irrigation water autonomy with greater efficiency by:
  - 1. Catching and controlling rainwater from the property's two existing, large roofs which should provide 53,793 gallons of rainwater per month as well as the roof of the Nature School (TBD)
  - 2. Creating an aquaculture pond (24,570 cubic feet) that feeds water to nearby chinampas as well as to drip-line irrigation hoses
  - 3. Using swales to slow and direct water from precipitation in a known flooding area and on the only significant contours of the property
- Together, these improvements make water available throughout all growing areas of the property. It will also free up labor to work on more valuable functions.



# Solar Energy Model

- Based on measurements of the south-facing roofs of the Main House and the Pavilion, 274 solar panels can be installed to generate 21,550 KWH of electricity per month on average
  - Ranges from 19,727 KWH in January to 23,762 KWH in May
- Current electricity usage of 12,620 KWH per month costs \$1,390 per month
  - Estimated electricity cost of \$434k for 26 years remaining in lease
- Solar system cost of approximately \$160k on equipment and \$15k on labor (assumes property provides some labor contribution)
- System will generate at least 8,000 KWH of excess electricity per month which can be sold back to the grid for approximately \$0.10 per KWH, providing \$800 per month of revenue as well as several tax benefits
- Investment of \$175k would be recovered within 6.7 years and would generate \$508k of savings plus revenue during the 232 months remaining in lease
- ▶ This is a productive use of capital with a 78% annual return and low risks
- Details provided in <u>Exhibit B</u>



# Biogas Energy Model

- The property currently consumers a 20 lbs propane tank every 3 days on average, costing approximately \$300 per month.
- Based on an initial audit of farm animal manure, the farm animals produce an estimated 264 lbs. of collectible manure per day.
- 264 lbs. of manure can be converted into biogas to provide 32 hours per day of flammable gas for a single burner on high
- A commercial biodigestor that can handle this volume would cost \$8k and a gas compressor that can fill transportable tanks of biogas would cost approximately \$2k.
- The biodigestor and compressor would pay for itself within 2.7 years and there would be plenty of surplus gas that can be sold to customers instead of propane if permitted by law



#### Details provided in <u>Exhibit C</u>

# Farm-to-Table Restaurant Model

- The design rebrands the restaurant as an authentic, upscale farm-to-table experience open 4 days a week (Thursday through Sunday) for lunch and dinner.
- Lunch will be priced at \$15 a head and dinner at \$30 a head and increase each year.
- At least 50% of the food served will be grown at the farm, providing gross margins of 400%.
- A chef, sous chef, and 2 servers will be employed 11am to 9pm Thursday to Sunday. The Marandos will not have to spend significant amounts of time in the kitchen or restaurant.
- Marketing costs start at \$500/month and increase each year.
- Gross revenues of \$333k projected in 2023 and \$484k in 2025 with \$264k of gross profit.
- Details provided in <u>Exhibit D</u>



# Children's Garden Model

- \$50k estimated one-time costs to build and furnish within 6 months
- One-time costs may be partially or fully met by sponsors
- Open from 830am-noon Monday through Friday with no fixed curriculum
- Modeled after Jeannie's successful Delray Beach Children's Garden
- Monthly fee of \$500+ for up to 20 children at full capacity
- Additional workshops for \$35+ each
- Teacher employed part-time Mon-Fri with part-time Admin Assistant
- Projected to generate a profits of \$50k in 2022 and \$140k in 2025
- ▶ 5 Year Return of \$418k with annual return of 208%
- Details provided in <u>Exhibit E</u>



## Mobile App Model

- The Mobile App will cost approximately \$42k and take 4-6 months to build, test, and publish for Android and iOS.
- With investments in App Store Optimization, App Store Ads, and Social Media Marketing of the app, it can gain nationwide visibility on the app stores
- Projections are based on 15%-20% of Marando Farms visitors becoming mobile app customers.
- Recover investment in 1 year with \$129k of profit projected in 2022
- ▶ 5 year return of \$872k with an annual return of 247%
- Details provided in <u>Exhibit F</u>



# Cannabis Farm Model

- One-time costs of approximately \$408k, including regulatory/licensing fees, solar electricity system, and rainwater catchment system
- One-time costs may be partially or fully met by sponsors
- Ongoing annual costs of approximately \$60k with dedicated part-time Cannabis Farmer responsible for growing, maintenance, and harvesting.
- Revenue ramps up from \$432k in 2021 to \$570k in 2025 as productivity and prices increase
- Recover investment in 1.25 years with \$415k of profit projected in 2022
- ▶ 5 year return of \$2.3m with annual rate of return of 114%
- Details provided in <u>Exhibit G</u>



#### Section IV NEXT STEPS



#### Next Steps

- Review and discuss design details
- Adjust according to your preferences
- Finalize design and determine funding requirements
- Develop implementation plan based on priorities
- Launch fundraising and sponsorship campaign
- Get necessary approval from municipality for plans
- Adjust implementation plan according to funding level and execute



# Thank You

- We are grateful for the opportunity to work on the design for this extraordinary place!
- Fly through the design on <u>Google</u> <u>Earth</u>







#### Section V EXHIBITS



# Exhibit A: Animal Food & Water Model Detail

| Animal Food & Water Model     |                       |                         |                             |
|-------------------------------|-----------------------|-------------------------|-----------------------------|
|                               |                       |                         |                             |
| Animal                        | Daily Water (Gallons) | Monthly Water (Gallons) | Monthly Cost (\$0.008725/G) |
| Turtles                       | 2                     | 61                      | \$ 1                        |
| Sheep                         | 4                     | 122                     | \$ 1                        |
| Pigs                          | 4                     | 122                     | \$ 1                        |
| Ponies                        | 10                    | 304                     | \$ 3                        |
| Goats                         | 4                     | 122                     | \$ 1                        |
| Turkeys                       | 4                     | 122                     | \$ 1                        |
| Horses                        | 8                     | 243                     | \$ 2                        |
| Bull                          | 4                     | 122                     | \$ 1                        |
| Donkeys                       | 8                     | 243                     | \$ 2                        |
| Chickens                      | 6                     | 183                     | \$ 2                        |
| Hogs                          | 20                    | 608                     | \$ 5                        |
| Total                         | 74                    | 2,251                   | \$ 20                       |
|                               |                       |                         |                             |
|                               | Per Week              | Per Month               |                             |
| Animal Food Invoice           | \$300                 | \$ 1.304                |                             |
|                               |                       | · _)•• ·                |                             |
|                               |                       |                         |                             |
|                               | Miles per Day         | Miles per Month         | Monthly Cost                |
| Gasoline Cost for Water Truck | 0.55                  | 17                      | Ś 10                        |



# Exhibit B: Solar Energy Model Detail

| House/Restaurant Roof           | Width (inches) | Panels | AVG Monthly WH | January WH | February WH | March WH  | April WH  | May WH    | June WH   | July WH   | August WH | September WH | October WH | November WH | December WH | Annual WH  |
|---------------------------------|----------------|--------|----------------|------------|-------------|-----------|-----------|-----------|-----------|-----------|-----------|--------------|------------|-------------|-------------|------------|
| South Facing Roof Row 1         | 1050           | 14.00  | 1,100,896      | 1,007,930  | 1,030,838   | 1,168,283 | 1,191,190 | 1,214,098 | 1,145,375 | 1,191,190 | 1,168,283 | 1,030,838    | 1,030,838  | 1,021,675   | 1,012,512   | 13,213,046 |
| South Facing Roof Row 2         | 1010           | 13.00  | 1,022,261      | 935,935    | 957,206     | 1,084,834 | 1,106,105 | 1,127,376 | 1,063,563 | 1,106,105 | 1,084,834 | 957,206      | 957,206    | 948,698     | 940,189     | 12,269,257 |
| South Facing Roof Row 3         | 970            | 13.00  | 1,022,261      | 935,935    | 957,206     | 1,084,834 | 1,106,105 | 1,127,376 | 1,063,563 | 1,106,105 | 1,084,834 | 957,206      | 957,206    | 948,698     | 940,189     | 12,269,257 |
| South Facing Roof Row 4         | 930            | 12.00  | 943,625        | 863,940    | 883,575     | 1,001,385 | 1,021,020 | 1,040,655 | 981,750   | 1,021,020 | 1,001,385 | 883,575      | 883,575    | 875,721     | 867,867     | 11,325,468 |
| South Facing Roof Row 5         | 890            | 12.00  | 943,625        | 863,940    | 883,575     | 1,001,385 | 1,021,020 | 1,040,655 | 981,750   | 1,021,020 | 1,001,385 | 883,575      | 883,575    | 875,721     | 867,867     | 11,325,468 |
| South Facing Roof Row 6         | 850            | 11.00  | 864,990        | 791,945    | 809,944     | 917,936   | 935,935   | 953,934   | 899,938   | 935,935   | 917,936   | 809,944      | 809,944    | 802,744     | 795,545     | 10,381,679 |
| South Facing Roof Row 7         | 770            | 10.00  | 786,354        | 719,950    | 736,313     | 834,488   | 850,850   | 867,213   | 818,125   | 850,850   | 834,488   | 736,313      | 736,313    | 729,768     | 723,223     | 9,437,890  |
| South Facing Roof Row 8         | 690            | 9.00   | 707,719        | 647,955    | 662,681     | 751,039   | 765,765   | 780,491   | 736,313   | 765,765   | 751,039   | 662,681      | 662,681    | 656,791     | 650,900     | 8,494,101  |
| South Facing Roof Row 9         | 610            | 8.00   | 629,084        | 575,960    | 589,050     | 667,590   | 680,680   | 693,770   | 654,500   | 680,680   | 667,590   | 589,050      | 589,050    | 583,814     | 578,578     | 7,550,312  |
| South Facing Roof Row 10        | 530            | 7.00   | 550,448        | 503,965    | 515,419     | 584,141   | 595,595   | 607,049   | 572,688   | 595,595   | 584,141   | 515,419      | 515,419    | 510,837     | 506,256     | 6,606,523  |
| South Facing Roof Row 11        | 450            | 6.00   | 471,813        | 431,970    | 441,788     | 500,693   | 510,510   | 520,328   | 490,875   | 510,510   | 500,693   | 441,788      | 441,788    | 437,861     | 433,934     | 5,662,734  |
| South Facing Upper Roof Row 1   | 265            | 3.00   | 235,906        | 215,985    | 220,894     | 250,346   | 255,255   | 260,164   | 245,438   | 255,255   | 250,346   | 220,894      | 220,894    | 218,930     | 216,967     | 2,831,367  |
| South Facing Upper Roof Row 2   | 175            | 2.00   | 157,271        | 143,990    | 147,263     | 166,898   | 170,170   | 173,443   | 163,625   | 170,170   | 166,898   | 147,263      | 147,263    | 145,954     | 144,645     | 1,887,578  |
| South Facing Upper Roof Row 3   | 75             | 1.00   | 78,635         | 71,995     | 73,631      | 83,449    | 85,085    | 86,721    | 81,813    | 85,085    | 83,449    | 73,631       | 73,631     | 72,977      | 72,322      | 943,789    |
| Pavillion Roof                  |                |        |                |            |             |           |           |           |           |           |           |              |            |             |             |            |
| South Facing Roof Row 1         | 1270           | 17.00  | 1,336,803      | 1,223,915  | 1,251,731   | 1,418,629 | 1,446,445 | 1,474,261 | 1,390,813 | 1,446,445 | 1,418,629 | 1,251,731    | 1,251,731  | 1,240,605   | 1,229,478   | 16,044,413 |
| South Facing Roof Row 2         | 1270           | 17.00  | 1,336,803      | 1,223,915  | 1,251,731   | 1,418,629 | 1,446,445 | 1,474,261 | 1,390,813 | 1,446,445 | 1,418,629 | 1,251,731    | 1,251,731  | 1,240,605   | 1,229,478   | 16,044,413 |
| South Facing Roof Row 3         | 1270           | 17.00  | 1,336,803      | 1,223,915  | 1,251,731   | 1,418,629 | 1,446,445 | 1,474,261 | 1,390,813 | 1,446,445 | 1,418,629 | 1,251,731    | 1,251,731  | 1,240,605   | 1,229,478   | 16,044,413 |
| South Facing Roof Row 4         | 1270           | 17.00  | 1,336,803      | 1,223,915  | 1,251,731   | 1,418,629 | 1,446,445 | 1,474,261 | 1,390,813 | 1,446,445 | 1,418,629 | 1,251,731    | 1,251,731  | 1,240,605   | 1,229,478   | 16,044,413 |
| South Facing Roof Row 5         | 1270           | 17.00  | 1,336,803      | 1,223,915  | 1,251,731   | 1,418,629 | 1,446,445 | 1,474,261 | 1,390,813 | 1,446,445 | 1,418,629 | 1,251,731    | 1,251,731  | 1,240,605   | 1,229,478   | 16,044,413 |
| South Facing Roof Row 6         | 1270           | 17.00  | 1,336,803      | 1,223,915  | 1,251,731   | 1,418,629 | 1,446,445 | 1,474,261 | 1,390,813 | 1,446,445 | 1,418,629 | 1,251,731    | 1,251,731  | 1,240,605   | 1,229,478   | 16,044,413 |
| South Facing Roof Row 7         | 1270           | 17.00  | 1,336,803      | 1,223,915  | 1,251,731   | 1,418,629 | 1,446,445 | 1,474,261 | 1,390,813 | 1,446,445 | 1,418,629 | 1,251,731    | 1,251,731  | 1,240,605   | 1,229,478   | 16,044,413 |
| South Facing Roof Row 8         | 1270           | 17.00  | 1,336,803      | 1,223,915  | 1,251,731   | 1,418,629 | 1,446,445 | 1,474,261 | 1,390,813 | 1,446,445 | 1,418,629 | 1,251,731    | 1,251,731  | 1,240,605   | 1,229,478   | 16,044,413 |
| South Facing Roof Row 9         | 1270           | 17.00  | 1,336,803      | 1,223,915  | 1,251,731   | 1,418,629 | 1,446,445 | 1,474,261 | 1,390,813 | 1,446,445 | 1,418,629 | 1,251,731    | 1,251,731  | 1,240,605   | 1,229,478   | 16,044,413 |
| Total KWH from House & Pavillio | on Roofs       | 274.00 | 21,546         | 19,727     | 20,175      | 22,865    | 23,313    | 23,762    | 22,417    | 23,313    | 22,865    | 20,175       | 20,175     | 19,996      | 19,816      | 258,598    |



PERMACULTURE SOLUTIONS

# Exhibit B: Solar Energy Model (continued)

| Costs           |               |
|-----------------|---------------|
| Panels          | \$<br>70,000  |
| Batteries       | \$<br>42,000  |
| Controllers     | \$<br>23,000  |
| Inverters       | \$<br>15,000  |
| Equipment       | \$<br>10,000  |
| Total Equipment | \$<br>160,000 |
|                 |               |
| Labor Costs     | \$15,000      |

| Lease Months Remaining  | 312           |
|-------------------------|---------------|
| Monthly Revenue         | \$800         |
| Monthly Savings         | \$<br>1,390   |
| Total Revenue + Savings | \$683,280.00  |
| Investment              | \$<br>175,000 |
| Total Rol               | 390%          |
| Annual Rol              | 78.1%         |



# Exhibit C: Biogas Energy Model Detail

| Farm Animal                    | Quantity               | Weight (lbs)    | Daily Manure/1000 lbs     | Daily Manure (lbs)  | % Collectable   | <b>Collected Daily</b> | <b>Collected Monthly</b> |
|--------------------------------|------------------------|-----------------|---------------------------|---------------------|-----------------|------------------------|--------------------------|
| Bull                           | 1                      | 2200            | 75                        | 165                 | 35%             | 58                     | 1,757                    |
| Stallion (with manure bag)     | 1                      | 1200            | 45                        | 54                  | 90%             | 49                     | 1,478                    |
| Mare (with manure bag)         | 1                      | 1000            | 45                        | 45                  | 90%             | 41                     | 1,232                    |
| Hog                            | 2                      | 800             | 11                        | 18                  | 75%             | 13                     | 402                      |
| Donkey (with manure bag)       | 2                      | 600             | 45                        | 54                  | 90%             | 49                     | 1,478                    |
| Pony (with manure bag)         | 3                      | 400             | 45                        | 54                  | 90%             | 49                     | 1,478                    |
| Adult Pig                      | 4                      | 150             | 11                        | 7                   | 0%              | -                      | -                        |
| Baby Pig                       | 6                      | 35              | 7                         | 1                   | 0%              | -                      | -                        |
| Goat                           | 3                      | 250             | 40                        | 30                  | 0%              | -                      | -                        |
| Sheep                          | 1                      | 200             | 40                        | 8                   | 0%              | -                      | -                        |
| Turkey                         | 4                      | 12              |                           | 3                   | 0%              | -                      | -                        |
| Chicken                        | 50                     | 6               |                           | 18                  | 40%             | 7                      | 217                      |
| Tortoise                       | 2                      | 12              |                           | 1                   | 0%              | -                      | -                        |
| Total                          |                        |                 |                           | 457                 |                 | 264                    | 8,041                    |
| 20 liters (5 gallons) of manur | e produce              | es 600 liters o | f biogas which provides 4 | 1.4 KWH (15.4 mega- | houles) of flam | nmable gas = 2 h       | ours of a stove gas b    |
| 1 gallon = .4 hours (24 minute | es) of flar            | ne              |                           |                     |                 |                        |                          |
| 1 gallon of dry manure weigh   | ns 3.34 lbs            | 5               |                           |                     |                 |                        |                          |
| 264 pounds of dry manure =     | 79 gallons             | s of dry manu   | re                        |                     |                 |                        |                          |
| 79 gallons of dry manure per   | <sup>.</sup> day = 31. | 6 hours per d   | ay of stove burner flame  | on high             |                 |                        |                          |



#### Exhibit D: Farm-to-Table Model Detail

| Revenues                                      |    | 2021     | 2022          | 2023          | 2024          | 2025          |
|---|----|----------|---------------|---------------|---------------|---------------|
| Lunch Customers per Day                       |    | 15       | 17            | 20            | 26            | 36            |
| Dinner Customers per Day                      |    | 20       | 22            | 26            | 34            | 48            |
| Lunch Customers per Year (Thu-Sun)            |    | 3,129    | 3,441         | 4,130         | 5,369         | 7,516         |
| Dinner Customers per Year (Thu-Sun)           |    | 4,171    | 4,589         | 5,506         | 7,158         | 10,021        |
| Lunch Revenue per Customer                    | \$ | 15.00    | \$<br>16.00   | \$<br>17.00   | \$<br>18.00   | \$<br>19.00   |
| Dinner Revenue per Customer                   | \$ | 30.00    | \$<br>31.00   | \$<br>32.00   | \$<br>33.00   | \$<br>34.00   |
| Annual Lunch Revenue                          | \$ | 46,929   | \$<br>55,063  | \$<br>70,205  | \$<br>96,635  | \$<br>142,806 |
| Annual Dinner Revenue                         | \$ | 125,143  | \$<br>142,246 | \$<br>176,201 | \$<br>236,220 | \$<br>340,729 |
| Total Revenue per Year                        | \$ | 172,071  | \$<br>197,309 | \$<br>246,406 | \$<br>332,855 | \$<br>483,534 |
|   |    |          |               |               |               |               |
| Costs   |    | 2021     | 2022          | 2023          | 2024          | 2025          |
| Food Cost per Lunch Customer (50% from farm)  | \$ | 3.00     | \$<br>3.20    | \$<br>3.40    | \$<br>3.60    | \$<br>3.80    |
| Food Cost per Dinner Customer (50% from farm) | \$ | 6.00     | \$<br>6.20    | \$<br>6.40    | \$<br>6.60    | \$<br>6.80    |
| Drink Cost per Lunch Customer                 | \$ | 1.50     | \$<br>1.60    | \$<br>1.70    | \$<br>1.80    | \$<br>1.90    |
| Drink Cost per Dinner Customer                | \$ | 2.10     | \$<br>2.17    | \$<br>2.24    | \$<br>2.31    | \$<br>2.38    |
| Total Cost per Lunch Customer                 | \$ | 4.50     | \$<br>4.80    | \$<br>5.10    | \$<br>5.40    | \$<br>5.70    |
| Total Cost per Dinner Customer                | \$ | 8.10     | \$<br>8.37    | \$<br>8.64    | \$<br>8.91    | \$<br>9.18    |
| Total Food & Drink Costs per Year             | \$ | 47,867   | \$<br>54,925  | \$<br>68,636  | \$<br>92,770  | \$<br>134,838 |
| Chef (Thu-Sun)                                | \$ | 20,000   | \$<br>20,000  | \$<br>20,000  | \$<br>20,000  | \$<br>20,000  |
| Sous Chef (Thu-Sun)                           | \$ | 15,000   | \$<br>15,000  | \$<br>15,000  | \$<br>15,000  | \$<br>15,000  |
| 2 Servers (Thu-Sun)                           | \$ | 20,000   | \$<br>20,000  | \$<br>20,000  | \$<br>20,000  | \$<br>20,000  |
| Utility Costs                                 | \$ | 1,825    | \$<br>2,008   | \$<br>2,409   | \$<br>3,132   | \$<br>4,384   |
| Credit Card and Banking Fees                  | \$ | 5,162    | \$<br>5,919   | \$<br>7,392   | \$<br>9,986   | \$<br>14,506  |
| Marketing Costs                               | \$ | 6,000    | \$<br>6,600   | \$<br>7,260   | \$<br>7,986   | \$<br>8,785   |
| Other Operating Costs                         | \$ | 1,500    | \$<br>1,650   | \$<br>1,815   | \$<br>1,997   | \$<br>2,196   |
| Total Costs                                   | \$ | 117,354  | \$<br>126,102 | \$<br>142,512 | \$<br>170,870 | \$<br>219,710 |
|   |    |          |               |               |               |               |
| Profit (Loss)                                 | \$ | 54,717   | \$<br>71,207  | \$<br>103,894 | \$<br>161,985 | \$<br>263,825 |
|   |    |          |               |               |               |               |
| Rebranding Costs                              |    | \$15,000 |               |               |               |               |
| 5 voar roturn                                 | ć  | 655 679  |               |               |               |               |
| S year return                                 | Ş  | 055,028  |               |               |               |               |



## Exhibit E: Children's Garden Model Detail

| Costs                              |               |              |               |               |               |
|------------------------------------|---------------|--------------|---------------|---------------|---------------|
| One-Time Costs                     |               |              |               |               |               |
| Planning                           | \$<br>5,000   |              |               |               |               |
| Construction Materials             | \$<br>20,000  |              |               |               |               |
| Construction Labor                 | \$<br>15,000  |              |               |               |               |
| Licensing & Fees                   | \$<br>2,500   |              |               |               |               |
| Classroom Furniture & Equipment    | \$<br>7,500   |              |               |               |               |
| Total One-Time Costs               | \$<br>50,000  |              |               |               |               |
|                                    |               |              |               |               |               |
| Ongoing Costs                      | 2021          | 2022         | 2023          | 2024          | 202           |
| Teacher (Mon-Fri 830am-1200pm)     | \$<br>20,000  | \$<br>20,400 | \$<br>20,808  | \$<br>21,224  | \$<br>21,649  |
| Admin Assistant                    | \$<br>10,000  | \$<br>10,200 | \$<br>10,404  | \$<br>10,612  | \$<br>10,824  |
| Educational Materials              | \$<br>3,600   | \$<br>3,780  | \$<br>3,969   | \$<br>4,167   | \$<br>4,376   |
| Marketing Costs                    | \$<br>3,000   | \$<br>3,300  | \$<br>3,630   | \$<br>3,993   | \$<br>4,392   |
| Internet & Software                | \$<br>900     | \$<br>945    | \$<br>992     | \$<br>1,042   | \$<br>1,094   |
| Total Ongoing Costs                | \$<br>39,521  | \$<br>40,647 | \$<br>41,826  | \$<br>43,063  | \$<br>44,360  |
|                                    |               |              |               |               |               |
|                                    |               |              |               |               |               |
| Revenues                           | 2021          | 2022         | 2023          | 2024          | 2024          |
| Monthly Members                    | 96            | 144          | 192           | 240           | 240           |
| Monthly Member Price               | \$<br>500     | \$<br>525    | \$<br>551     | \$<br>579     | \$<br>608     |
| Monthly Member Revenue             | \$<br>48,000  | \$<br>75,600 | \$<br>105,840 | \$<br>138,915 | \$<br>145,861 |
| Workshop Attendees                 | 168           | 324          | 528           | 624           | 720           |
| Workshop Attendance Price          | \$<br>35      | \$<br>40     | \$<br>45      | \$<br>50      | \$<br>55      |
| Workshop Attendance Revenue        | \$<br>5,880   | \$<br>12,960 | \$<br>23,760  | \$<br>31,200  | \$<br>39,600  |
| Total Revenue                      | \$<br>53,880  | \$<br>88,560 | \$<br>129,600 | \$<br>170,115 | \$<br>185,461 |
|                                    |               |              |               |               |               |
| Profit (Loss)                      | \$<br>14,359  | \$<br>47,913 | \$<br>87,774  | \$<br>127,052 | \$<br>141,101 |
|                                    |               |              |               |               |               |
| Investment Required                | 50,000        |              |               |               |               |
| 5 Year Return                      | \$<br>418,199 |              |               |               |               |
| Annual Rate of Return Over 5 Years | 167%          |              |               |               |               |



# Exhibit F: Mobile App Model Detail

| Mobile App Costs                        |     |          |    |         |               |    |         |               |
|---|-----|----------|----|---------|---------------|----|---------|---------------|
| One-Time Costs                          | Hou | rs       | С  | ost     |               |    |         |               |
| App Design                              |     | 40       | \$ | 3,200   |               |    |         |               |
| App Development                         |     | 400      | \$ | 32,000  |               |    |         |               |
| App Testing                             |     | 80       | \$ | 6,400   |               |    |         |               |
| App Publishing                          |     | 10       | \$ | 800     |               |    |         |               |
| Total One-Time Costs                    |     |          | \$ | 42,400  |               |    |         |               |
| Ongoing Monthly Costs                   |     | 2020     | -  | 2021    | 2022          |    | 2023    | 202           |
| Software Licensing                      | \$  | 83       | \$ | 83      | \$<br>83      | \$ | 83      | \$<br>83      |
| App Store Publishing                    | \$  | 25       | \$ | 25      | \$<br>25      | \$ | 25      | \$<br>25      |
| Bug fixes/improvements                  | \$  | 240      | \$ | 300     | \$<br>375     | \$ | 469     | \$<br>586     |
| App Store Optimization (ASO)            | \$  | 500      | \$ | 750     | \$<br>1,000   | \$ | 1,250   | \$<br>1,500   |
| App Store Ads                           | \$  | 500      | \$ | 750     | \$<br>1,000   | \$ | 1,250   | \$<br>1,500   |
| Social Media Marketing                  | \$  | 1,000    | \$ | 1,500   | \$<br>2,000   | \$ | 2,500   | \$<br>3,000   |
| Total Monthly Costs                     | \$  | 2,348    | \$ | 3,408   | \$<br>4,483   | \$ | 5,577   | \$<br>6,694   |
| Total Annual Costs                      | \$  | 28,180   | \$ | 40,900  | \$<br>53,800  | \$ | 66,925  | \$<br>80,331  |
|   |     |          |    |         |               |    |         |               |
| Mobile App Revenues                     |     | 2020     |    | 2021    | 2022          |    | 2023    | 202           |
| Total Monthly Visitors to Marando Farms |     | 900      |    | 990     | 1188          |    | 1544    | 216           |
| % Converted to Day Pass Customers       |     | 15%      |    | 14%     | 13%           |    | 11%     | 109           |
| Monthly Day Pass Customers              |     | 135      |    | 136     | 149           |    | 174     | 21            |
| Monthly Revenue from Day Pass Customers | \$  | 2,700    | \$ | 2,723   | \$<br>2,970   | \$ | 3,475   | \$<br>4,324   |
| % Converted to Monthly Members          |     | 5%       |    | 5%      | 5%            |    | 5%      | 5%            |
| Monthly Members                         |     | 45       |    | 50      | 59            |    | 77      | 10            |
| Monthly Revenue from Monthly Members    | \$  | 1,350    | \$ | 1,485   | \$<br>1,782   | \$ | 2,317   | \$<br>3,243   |
| % Converted to Annual Members           |     | 0%       |    | 2%      | 3%            |    | 4%      | 5%            |
| Annual Members                          |     | 0        |    | 20      | 36            |    | 62      | 10            |
| Monthly Revenue from Annual Members     | \$  | -        | \$ | 5,841   | \$<br>10,514  | \$ | 18,224  | \$<br>31,892  |
| Total Monthly Mobile App Customers      |     | 180      |    | 205     | 244           |    | 313     | 43            |
| Total Annual Mobile App Customers       |     | 2160     |    | 2465    | 2922          |    | 3753    | 518           |
| Total Monthly Mobile App Revenue        | \$  | 4,050    | \$ | 10,049  | \$<br>15,266  | \$ | 24,015  | \$<br>39,459  |
| Total Annual Mobile App Revenue         | \$  | 48,600   | \$ | 120,582 | \$<br>183,190 | \$ | 288,185 | \$<br>473,513 |
|   |     |          |    |         |               |    |         |               |
| Profit (Loss)                           | \$  | (21,980) | \$ | 79,682  | \$<br>129,390 | \$ | 221,260 | \$<br>393,182 |
| Investment Required                     |     | 42,400   | -  |         |               | -  |         | <br>          |
| 5 Year Return                           | \$  | 801,533  |    |         |               |    |         |               |
| Annual Rate of Return Over 5 Years      |     | 378%     |    |         |               |    |         |               |



# Exhibit G: Cannabis Farm Model Detail

| One-Time Costs                                 |    |           |    |         |    |         |    |         |    |         |
|--|----|-----------|----|---------|----|---------|----|---------|----|---------|
| Freight Farm                                   | \$ | 115,000   |    |         |    |         |    |         |    |         |
| Clearing Area for Freight Farm                 | \$ | 5,000     |    |         |    |         |    |         |    |         |
| Security                                       | \$ | 5,000     |    |         |    |         |    |         |    |         |
| Solar Electricity System                       | \$ | 10,000    |    |         |    |         |    |         |    |         |
| Rainwater Catchment                            | \$ | 3,500     |    |         |    |         |    |         |    |         |
| Medical Marijuana Growing Licensing            | \$ | 250,000   |    |         |    |         |    |         |    |         |
| Legal & Professional Fees                      | \$ | 12,000    |    |         |    |         |    |         |    |         |
| Contingencies                                  | \$ | 8,010     |    |         |    |         |    |         |    |         |
| Total One-Time Costs                           | \$ | 408,510   |    |         |    |         |    |         |    |         |
|  |    |           |    |         |    |         |    |         |    |         |
| Ongoing Costs                                  |    | 2021      |    | 2022    |    | 2023    |    | 2024    |    | 2025    |
| Seeds & Growing Supplies                       | Ş  | 6,000     | Ş  | 6,120   | Ş  | 6,242   | Ş  | 6,367   | Ş  | 6,495   |
| Cannabis Farmer (part-time)                    | Ş  | 20,000    | Ş  | 20,400  | Ş  | 20,808  | Ş  | 21,224  | Ş  | 21,649  |
| Packaging & Materials                          | \$ | 3,600     | \$ | 3,672   | \$ | 3,745   | \$ | 3,820   | \$ | 3,897   |
| Licensing Fees                                 | \$ | 15,000    | \$ | 15,750  | \$ | 16,538  | \$ | 17,364  | \$ | 18,233  |
| Legal & Professional Fees                      | \$ | 12,000    | \$ | 12,600  | \$ | 13,230  | \$ | 13,892  | \$ | 14,586  |
| Contingencies                                  | \$ | 2,830     | \$ | 2,927   | \$ | 3,028   | \$ | 3,133   | \$ | 3,243   |
| Total Ongoing Costs                            | \$ | 59,430    | \$ | 61,469  | \$ | 63,592  | \$ | 65,801  | \$ | 68,102  |
|  |    |           |    |         |    |         |    |         |    |         |
| Revenues                                       |    | 2021      |    | 2022    |    | 2023    |    | 2024    |    | 2025    |
| Marijuana Produced (Ibs)                       |    | 288       |    | 302     |    | 318     |    | 333     |    | 350     |
| Wholesale Price for Medical Marijuana (per lb) | \$ | 1,500     | \$ | 1,575   | \$ | 1,654   | \$ | 1,736   | \$ | 1,823   |
| Revenue from Wholesale Sales                   | \$ | 432,000   | \$ | 476,280 | \$ | 525,099 | \$ | 578,921 | \$ | 638,261 |
|  |    |           |    |         |    |         |    |         |    |         |
| Profit (Loss)                                  | \$ | 372,570   | \$ | 414,811 | \$ | 461,507 | \$ | 513,120 | \$ | 570,159 |
|  |    |           |    |         |    |         |    |         |    |         |
| Investment Required                            |    | 408,510   |    |         |    |         |    |         |    |         |
| 5 Year Return                                  | \$ | 2,332,168 |    |         |    |         |    |         |    |         |
| Annual Rate of Return Over 5 Years             |    | 114%      |    |         |    |         |    |         |    |         |

