



# EXPLORE

A GUIDE TO RANCHO MASTATAL

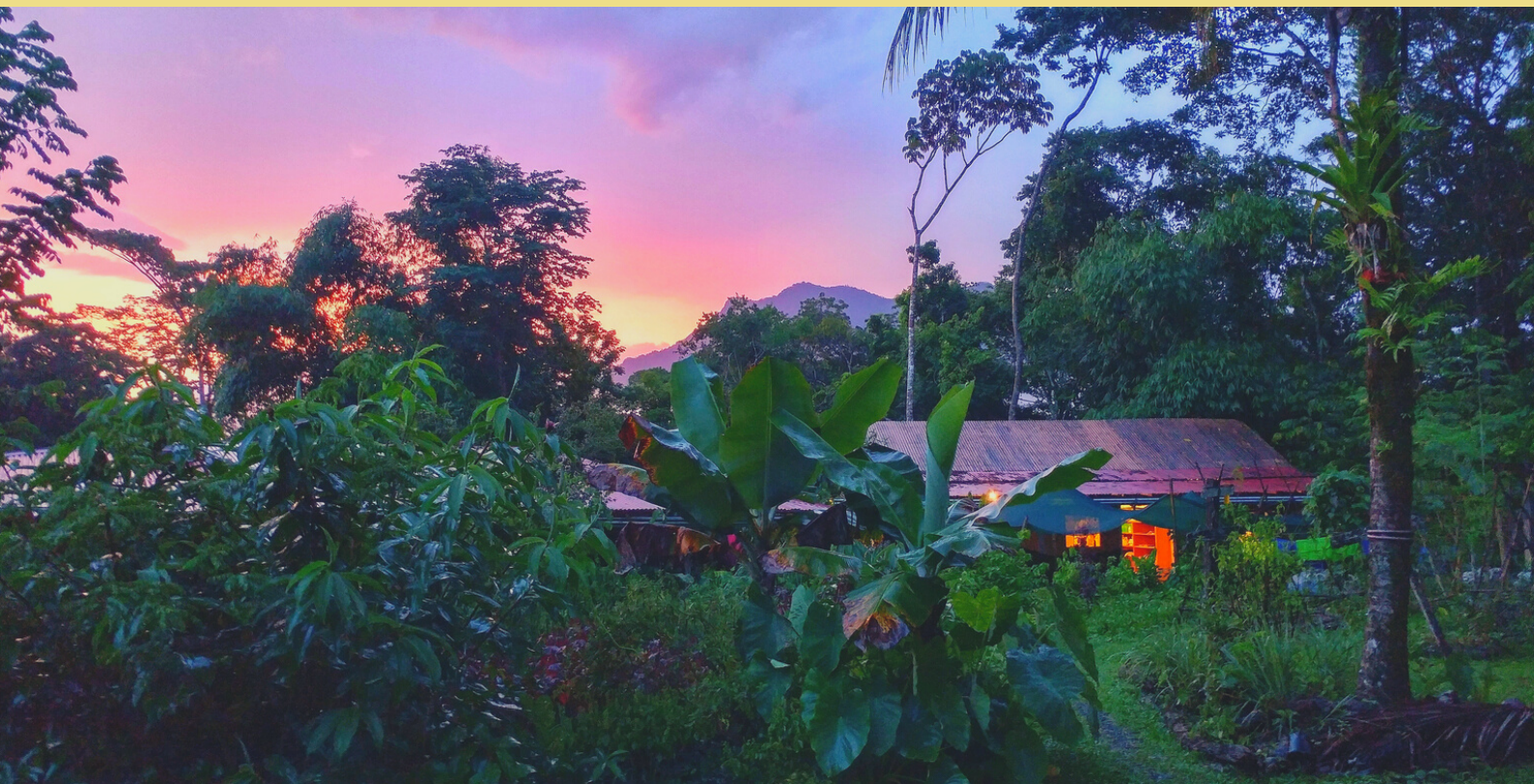
*Rancho Mastatal is an education center, working permaculture farm, lodge and community rooted in environmental sustainability, meaningful, place-based livelihoods, and caring relationships.*





# “What is this guide?”

*This guide was created to further our educational mission by helping better inform visitors about what we do. While we would love to be able to offer a personal tour to everyone that comes through our gates, we have found that charging for a tour has become a barrier for some people to receive important information about our project that would otherwise help them make the most out of their stay. For the most interactive and personalized Ranch experience, we recommend that you book a tour with one of our core team members. During this 2-hour tour of our campus, you will be able to ask questions and engage with someone who has personal knowledge and experience about all the systems that we have in place. However, as an alternative option, we have created this guide to highlight some of the key activities and strategies that we are doing and employing at the Ranch and to give you a better idea of the community and farm that you are visiting and supporting. We hope that you enjoy this guide and your time at Rancho Mastatal!*



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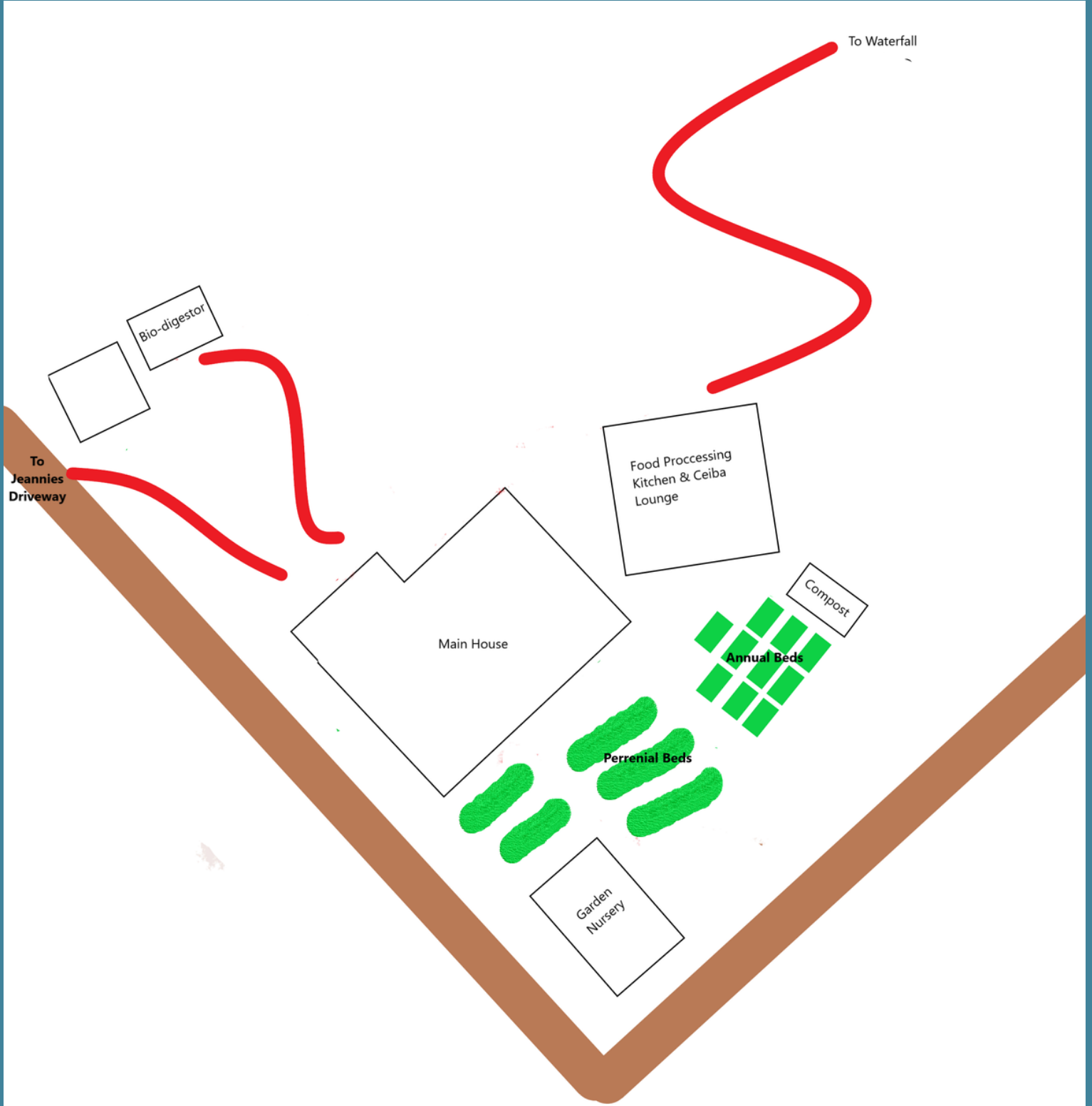
# Creating Community

*Robin and Timo moved to Mastatal from Seattle, USA in 2001 to found the Ranch and begin the next chapter of their lives. Many pieces of this endeavor were planned and many were not. They have been able to adapt and change to what has been an ever evolving business and community. They have a child, Solé, who was born in 2008, and who attends the local school.*

In 2001 when Robin and Timo moved here, there were no formal businesses in town and the economy in this small rural town was quite depressed. There were no phones or internet, the water and electricity were unreliable, and the roads would frequently wash out in the rainy season. It is hard to imagine what Mastatal used to look like, but there is one characteristic that hasn't changed in all these years, and one that Tim and Robin were quick to identify and relate to; a sense of community. Since then they have worked tirelessly to contribute to the further

development of the communities both inside the gates of the Ranch and outside in the wider community of Mastatal. The Ranch has been a large economic driver in this area, bringing in foreigners and tourists and creating opportunities for business and employment that were not here before. At the Ranch itself, a sense of community and family have been nurtured with a focus on communal eating, living, working and playing. Today you see a community that is ever more resilient and inclusive and we look forward to sharing it with you.

# Map of Main House Area





# Perennial and Annual Plants



*As you walk around the front gardens you will see many plants that you may not recognize. We are interested in developing and eating low maintenance and easy to manage perennial crops that will be productive in poor soils and during our harsh seasons. Much of Costa Rica has poor agricultural soils and in order to grow food on our property, a lot of organic inputs and amendments are required. Costa Rica is unfortunately the world's largest consumer of agro-chemicals per capita.*

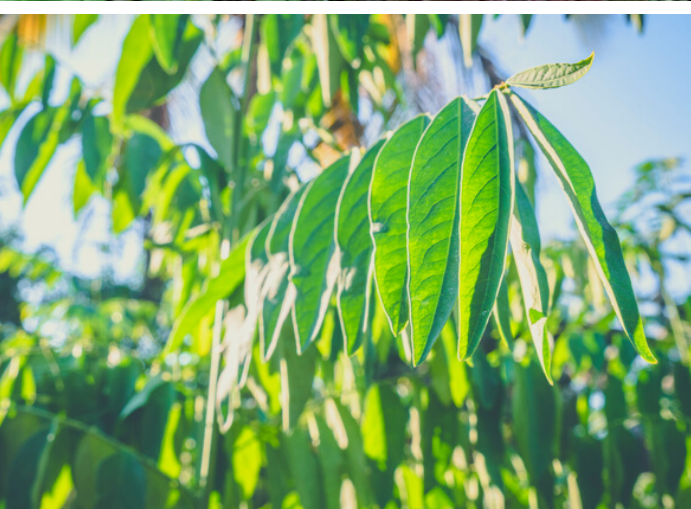


## BAMBOO NURSERY

Like many of our structures, this bamboo nursery was built in 2018 during a workshop. The course was led by Martin Coto, a master bamboo builder in Costa Rica with over 30 years of experience working with this amazing natural resource. We have been collaborating with Martin for many years and you will see other structures built with him around our campus.

## PERENNIAL GREENS

We grow the majority of our salad greens here in "Zone 1". A good proportion of these come from perennial greens such as katuk (bottom left), cranberry hibiscus (left middle), and kangkong. The other greens that we sometimes use are mustard and Asian greens. These need a bit more tender loving care and are grown under the transparent roof.



## COMPOST

All of the organic waste created in the kitchen is composted in our front garden compost area at the far end of the garden. Once the material has fully decomposed, it is sifted and used in the garden beds as a soil amendment..



# “ The Beauty of Clay Carvings

*in 2017 we hosted a natural building workshop with the Steen family from Arizona, USA. Athena Steen is well known in the natural building community for her beautiful clay art. She has developed a technique of building up layers of different colored clays and then carving them away to reveal the different colors. During the 2017 workshop, the exterior of the food processing kitchen was designed and carved. It's a great testament to the beauty and simplicity of clay as a building material. See if you can spot any other clay carvings on the Ranch.*







# Meet Doña Flor

*The Ranch serves over 24,000 meals every year and each morning we eat eggs. That means a lot of chickens in order to produce all of those eggs. Since 2003 Flor has been supplying the Ranch with most of its eggs from her family-run farm just across the river.*

Eggs make up a large part of our diet and we consume them daily in considerable amounts. We have always tried to source as much of our food as locally as possible and Doña Flor was quick to identify eggs as a good micro-enterprise that she could develop and use to generate income to support her family while simultaneously helping us. She lives about 3 km from the Ranch in a town called San Vicente. During our high season we consume between 90-130 eggs daily! Several times each week one of her family members will navigate the bumpy roads to deliver fresh eggs to us in well-protected,

reusable trays. Over the years, as transportation options have become more prevalent in and out of this community, the availability of cheaper, factory farmed eggs has become an alternative for us. Nevertheless, with this option comes an environmental impact that is not factored in to the price. We have always maintained our commitment to Doña Flor as we think that she is by far our best choice. She is honest, reliable and hardworking and the kind of neighbor and person that we want to support and hope can stay in this community for generations to come.



# Alternative Cooking Technology



*Propane is commonly used for cooking around the world, and like all fossil fuels, the world's supply is finite. We are interested in supporting and developing alternative cooking technologies that provide viable alternatives. We have many examples at the Ranch. We have principally focused on using firewood due to the abundance of wood offcuts from our woodshop.*

## **EARTHEN OVEN (TOP LEFT)**

This is our 3rd iteration of an earthen oven. Each of the previous designs lasted about 8 years, a decent amount of time given the amount of use that they got. Our newest oven was designed and built in 2019 with the help of Ayal Bryant of Barro Vivo in Costa Rica during an oven building workshop. Ayal has built over 20 earthen ovens throughout the country and we were excited and honored to work with him on this project.



## **ROCKET STOVES (MIDDLE LEFT)**

The rocket stove design was made famous by work conducted at the Aprovecho Research Center in Oregon, USA. The design increases fuel efficiency and reduces or eliminates smoke. This is achieved via an L-shaped burn chamber that increases airflow to the fire leading to a cleaner, more complete combustion. Over 4 million women die each year globally from pulmonary issues caused by smoke inhalation.



## **ACE STOVES (BOTTOM LEFT)**

The ACE brand rocket stove was originally designed in Lesotho and has taken the aeration of the burn chamber to another level. ACE stoves use a small solar powered fan under the burn chamber to aerate even more efficiently than the traditional rocket stove design. This means that we can use even smaller bits of wood offcuts and achieve a virtually 100% efficient flame that creates almost no smoke or soot.





# The Biodigester

*The Ranch has two biodigestors, one that processes all of the human waste in this sector of our campus (including the flush toilet in the main house), and one that uses local cow manure. Methane is produced during the anaerobic digestion of the organic material. After 30 days inside the biodigestors, all toxic and dangerous pathogens are eradicated and nutrient rich, liquid effluent and gas are produced. The effluent is used as a fertilizer and the gas is piped directly to our kitchen.*

*To the left of the toilets is the cow manure biodigester. Here, solids extracted from the cow manure are fed to worms to create vermicompost for our garden. This is in addition to the methane and effluent that we acquire from this system.*



# Local Food, Local Economy



*Since the Ranch began, one of its primary focuses has been food, and more specifically our kitchen, local food production, and the support of local farmers. Our kitchen philosophy is grounded in the understanding that every part of food production, from farm to harvest to storage to preparation and preservation, is inherently linked in a food system that we have the power to continuously influence and participate in. By purchasing local products, we support our local farmers financially and reduce packaging and transportation. We get fresher produce that is healthier for us and the planet.*



## TAPA DULCE (TOP)

Every morning you will see a stainless steel container of "tapa dulce syrup" in the dining area. "Tapa dulce" is unrefined sugar that originates in San Miguel (5 km away). The sugar cane is squeezed to make juice with the help of a press powered by a pair of yoked oxen. The juice is then boiled down in a large cauldron using firewood. A thick syrup is then allowed to cool and crystallize into blocks of "tapa dulce".

## FOOD SECURITY

While it is common for people to want to be self sufficient, this has never been a goal of the Ranch. We believe in regional food security. We grow as much food as we can on our land and then supplement this production with regionally sourced food. Approximately 80% of our calories come from within 15 km of the Ranch.



## CONDIMENTS

At virtually every meal you will see a variety of fresh condiments on the serving table. We ferment a number of products including hot sauces, kimchi, kraut, pickles, water kefir and dairy kefir. Fermented foods are high in probiotics and essential for a healthy gut and body. Make sure to try them at your next meal.



# “ What is fermentation?”

*Fermentation is the breaking down of sugars by microorganisms in an anaerobic environment. Many foods and drinks are fermented including yoghurt, kimchi, chocolate, coffee and alcohol. The process of fermentation changes the chemical makeup of your food or drink and oftentimes enriches and deepens its flavor. Fermentation is a natural preservative used to store vegetables and other foods without the need for refrigeration. At every lunch at the Ranch we serve live-culture water kefir "soda". It will be on the same table where the coffee is served in the mornings. We make huge amounts of water kefir each year using our locally sourced "tapa dulce". The fizz is created by the production of carbon dioxide, a by-product of the fermentation process. We squeeze and process all of our own fruit juices from our farm or local farms and use it to flavor the water kefir. To learn more about water kefir check out our "day workshops".*



*Starfruit being squeezed in order to flavor our water kefir. What's your favorite flavor?*





## Meet Jose Luis

*Jose Luis Zuniga and his family live just outside of Puriscal, about 30 km from the Ranch. Puriscal is situated at a much higher elevation than Mastatal and is at an ideal altitude for growing high quality coffee. Jose Luis and his family grow, process and roast all of their production right at their farm. We have been buying most of Jose Luis' production since 2001.*

How many places in Costa Rica serve free, local, organic coffee? Coffee has become a staple in the Western world and many people consume it everyday. We greatly value our local, organic coffee. Jose Luis and his family have been supporters of the Ranch since its inception. Jose Luis is a man of many talents and even helped us to construct our human biodigester based on the one that he has on his farm.

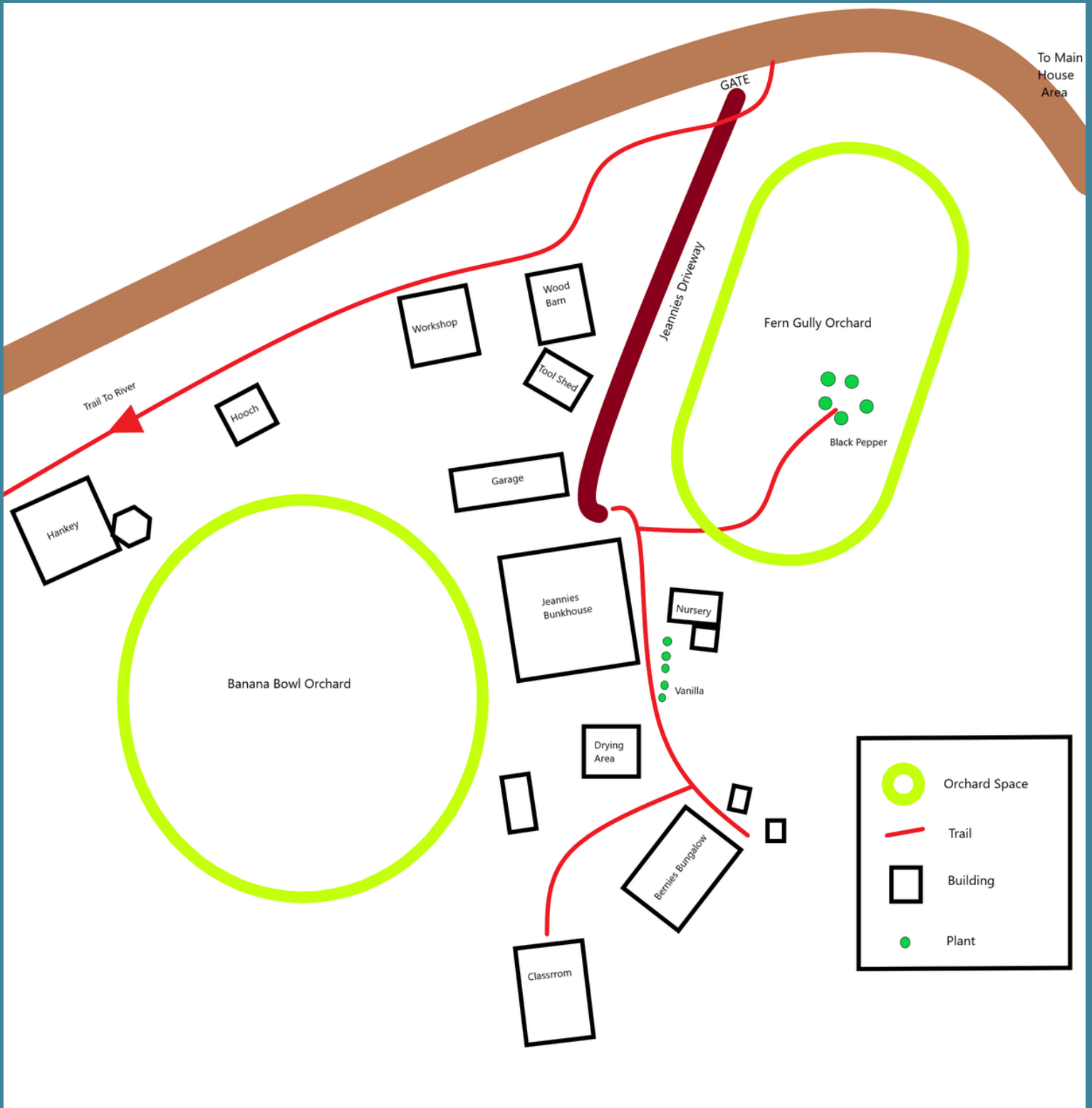
We consume hundreds of kilos of coffee each year and when we start to run low, we phone up Jose to order another 25 kilos of freshly roasted coffee.

He then immediately begins the process of roasting his beans and packs them into a reusable sack. The next day at 3 pm he puts the sack on the public bus to Mastatal. At 5 pm we go out to the bus, as it arrives in town, to collect the coffee. Mastatal's version of Amazon Prime! Everyday the coffee is ground to provide delicious fresh coffee.

If you like the coffee that we serve in the morning, consider buying some to take home to your friends and relatives (or even for yourself!). It can be found in our gift shop in 1 lb recyclable bags.



# Map of Jeanne's Area





# Agroforestry Systems



As you walk down Jeanne's driveway (see map), on your left hand side you will see one of our orchard spaces. This one is called Ferngully. Here you will find a variety of fruit trees and plants such as salak, pejobaye, black pepper (top left), rambutan (middle left), mangosteen and many other exotic fruits. At the end of our driveway is Jeanne's House, the bunkhouse where the majority of our large groups stay.

## JEANNE'S

When Robin and Timo bought the Ranch in 2001, there were only 2 existing structures. One of them was Jeanne's house and it is still here! There is space for 19 people inside the bunkhouse. There are also 3 showers and 2 composting toilets.

## AGROFORESTRY

Our agroforestry systems have been designed for our specific altitude, topography and climate. If you walk around Ferngully you should be able to see rows of *Acacia mangium* and vetiver grass. These are planted on contour, or perpendicular to the slope, as support species to mitigate erosion and to add organic matter via pruning and mulch. These contour plantings also help trap nutrients that the food producing trees can then take advantage of. See if you can spot any fruit on the trees.

## NFTS

Nitrogen fixing Trees (NFT) have a symbiotic relationship with a *Rhizobium* bacteria that form nodules on the plants' roots. These nodules are able to take inert nitrogen from the air and turn it into a water soluble form of nitrogen. This process makes the nitrogen available for nutrient uptake by the plant. Nitrogen is one of the most important nutrients for plant growth along with potassium and phosphorous. We use many species of NFTs at the Ranch. Many are either *Acacia mangium* or *Gliricidia sepium*.





# “What is Permaculture?”

*Permaculture speaks to sustainable land use design. It is based on ecological and biological principles, often using patterns that occur in nature to maximize efficiency and minimize work. Permaculture aims to create stable, productive systems that provide for human needs, harmoniously integrating the land with its inhabitants. The ecological processes of plant and animal nutrient cycles alongside climatic factors and weather cycles are all part of the picture. Within this philosophy, inhabitants' needs are provided for by using proven technologies for food, energy, shelter and infrastructure. Elements in a system are viewed in relationship to other elements, where the outputs of one element become the inputs of another. Within a Permaculture system, work is minimized, “wastes” become resources, productivity and yields of all kinds increase, and environments are restored. Permaculture principles can be applied to any environment, at any scale from dense urban settlements to individual homes, from farms to entire regions. As you walk around the Ranch try and see these patterns and systems. It's not just about food production. Want to learn more, why not take a "day workshop" with us?*



Students in class at our annual Permaculture Design Certification (PDC).



# Timber, Bamboo & Earth

*As you walk around the back of the bunkhouse you will find Bernie's Bungalow and our classroom. Both of these structures are made from predominantly natural materials. Natural building is a focus at Rancho Mastatal. We take pride in designing and building our own structures to minimize the impact on our environment and maximize their sustainability. We use local labor and resources to not only build our infrastructure but also community.*

## BAMBOO

Bamboo is an extremely fast growing plant in the grass family. There are many different species of bamboo but only a few types that are commonly used structurally in buildings. We use structural bamboo to create edifices like our classroom and we also use bamboo milled into strips as the wattle in many of our natural wall systems.

## EARTHEN WALLS

All of the walls at Bernie's including the shower and composting toilet are made from earth. The shower walls were created using adobe bricks that are formed and left to dry in the sun and the other walls around the site are made using a technique called wattle and daub (photo bottom left). A wattle of bamboo is covered in a daub made of sand, straw and clay.

## TIMBER FRAME

Timber framing is an age-old technique of joining large, dimensional timbers using mortise and tenon joinery secured by wooden pegs. The frame at both Bernie's and the shower is made with this technique along with many others around the Ranch campus.








# The Ancient Art of Tadelakt

*Bernie's Shower is plastered with a technique named Tadelakt. Tadelakt is an ancient form of lime plaster originating in Morocco. Lime is considered a durable, long lasting and natural plaster that can be used to finish earthen walls. Lime has an interesting life cycle and can be continually re-fired to make it a workable material again. It is a great choice for wet areas like the shower. By heavily burnishing the surface using a precious stone and applying our homemade soap, we are able to create a polished, smooth, durable finish that is water resistant, natural and beautiful.*





## Meet Isidro & Arabela

*Isidro and Arabela have been long-term friends and supporters of Rancho Mastatal and have reliably been providing us an array of "cow and pig" products for many years. Arabela milks the cows and makes the cheese and sour cream while Chilo tends to the cattle and pigs and collects cow manure for our biodigestor.*

Tuesday is PUMP day at the Ranch, an acronym meaning "Pick Up Milk & Poop". Every week we head over to Isidro and Arabela's small farm located 500 m down the road to collect 10 sacks of cow manure to feed one of our 2 biodigestors, 3 gallons of fresh milk still warm from the cow, and 2 or 3 kilos of fresh farmer's cheese. Some mornings you'll run into Isidro before he goes out to tend to his cattle and if so he'll surely invite you to see his pigs. Isidro takes great pride in his animals. Once or twice a year we will buy a pig from him to process into all sorts of local pork culinary goodies.

On Fridays, Isidro delivers another 3 gallons of milk right to the Ranch kitchen. We use the milk primarily to put into our local, organic coffee and also to make dairy kefir that is then used to make banana/cacao smoothies and oil-free salad dressings. The cheese is incorporated into our meals by adding it to scrambled eggs or refried beans. Sometimes we bake the it with ripe plantains or have it grated on top of casseroles or in a plethora of other yummy dishes coming out of our busy kitchen. We also buy cheese from other local farmers and it seems as if we can never get enough!



# Waste Not, Want Not

*In the vicinity of the classroom and Bernie's, there are 3 composting toilets. We have 11 composting toilets in total throughout our campus. These composting toilets are a fantastic way to recycle our human waste and return the finished humanure back to our orchard spaces. This process closes the loop between food production, consumption and waste.*

## COMPOSTING TOILETS

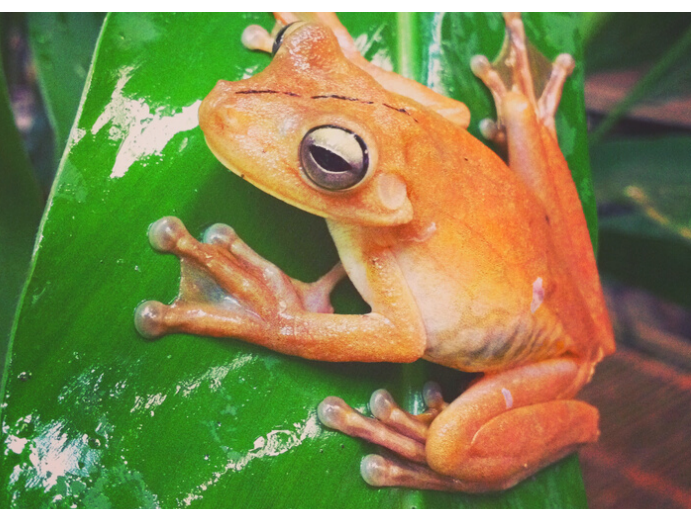
We use a simple yet effective composting, or moldering, toilet system at the Ranch. They're designed with two large vaults that receive "deposits". Only 1 vault receives deposits at any given time. After users leave their deposit, they cover it with sawdust. When the vault is full, we move the toilet seat to the other vault. After the second vault is full, the first vault is ready to be harvested and spread on the orchards. The process then begins again.

## GREYWATER

We try to use our greywater in areas around the Ranch that historically need irrigation. We harness the greywater and direct it to fruit trees and food producing crops. The Main House kitchen water irrigates an orchard behind the gravel pile on the road. Have a look around this area and see how we are using our greywater

## WILDLIFE REFUGE

in 2003 the Ranch set aside over 200 acres of mostly secondary rainforest as a "private wildlife refuge". The majority of this land is between the Main House and La Cangreja National Park. Within this beautiful sanctuary you can explore waterfalls, rivers and trails. See if you can spot some of the wonderful wildlife that is abundant all around you.





# “ A Final Word

*We offer many educational experiences at Rancho Mastatal. We hope that you have enjoyed this short introduction to the Ranch and the surrounding community. If you would like to learn more about any of the topics that we focus on, we offer short 2-3 hour classes on many of the subjects mentioned in this guide. Please see our "Welcome Guide" for more details on our "Day Workshops". You may also consider joining us for one of our longer workshops. We generally run a Natural Building and Permaculture Design Certification course each year along with many other workshops on a range of topics related to sustainability. We would appreciate if you wrote a review about us online through Facebook or on Google. Make sure that you are signed up online for our blog and updates so that you can learn about all our upcoming activities and read our articles. If you enjoyed your time at the Ranch and are looking for ways that you can apply some of what you have seen here, check out our "What Next" document detailing activities that you can do when you get home. Thank you and we hope to see you again!*

*The Ranch Crew*



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