DAINTREE LIVING FACTSHEET

Toilet Systems (beta ver. 1.0)

In the Daintree, there are three main toilet system options: composting toilets, waste water plants, and septic systems.

Related Factsheets

Power Systems (pdf, [file size]) *Estimating your energy needs. Requirements, installation, and maintenance of solar and other renewable energy source options. Batteries, inverters, generators.*

Water Sources (pdf, [file size]) *Water table and rainfall fluctuations; contamination and filtration; water conservation and recycling, Water system installation and maintenance issues for rain, stream/creek, and bore sources.*

Waste Management (pdf, [file size]) *Grey water systems, composting, recycling non-organics, e-waste options, creative reuse, burning or, as a last resort, the dump.*

Composting toilets

If managed correctly, composting toilets are generally better for the environment and there are no restrictions in regards to soil type or groundwater. These require no water and need very little power to run the ventilating fan (12 or 24V DC), which is essential in this environment, not only to remove smells – but to dry the contents. The system residue can be processed through your garden composting system so that you are able to retain and re-use nutrients.

A self contained composting system – suitable for small families.

There are quite a variety of compost systems, but for a small household, 'batch' rather than continuous systems are recommended. The toilet pedestal will need to be elevated above the compost bin, somemore than others. If possible, consider this in the design of your house. And, some systems operate better in the Daintree than others (because of the warmth). Make sure the model you choose has been proven to work in a wet, tropical environment.

One of the biggest issues here is the wet (and the associated high humidity). It is very difficult to dry compost during the wet season and compost solids need to be removed periodically, the frequency depends on the system and use. There is no service to do this, so you will have to do it yourself .

Keeping it dry..

Modern DC ventilating fans generally require less than 5 watts of energy, so it will have little impact on your power system. Use a 1A fuse and connect it on the load side of the metering shunt . 24V

fans are a bit more difficult to source..

Ensure that your fan is easy to remove for occasional cleaning of the blades and the throat of the fan with a toothbrush. Otherwise bug build-up, mostly harmless soldier flies, will cause the fan to stop working and unpleasant odours to emerge. Make sure you clean your fan during sunny weather and put it in the sun to dry out thoroughly before re-installing it – otherwise the dread Daintree fungi will attack. One suggested fan (illustrated) is available from Jaycar – and has proved to be the best (12V 380mA) – silent, powerful and easy to clean.

This fan is installed in a simple carrier, which allows easy removal. The white is a foam plastic gasket to reduce smells in the immediate vicinity of the fan (made out of packing foam and contact glued on).

Make sure you have a cap on the exhaust above the roof – so rainwater doesn't flow back into the system.

Urine Drain

Separating liquid from solid waste can be accomplished with some modern composer pedestals which have a urine diverter in them. The urine, which is essentially sterile, is either collected in a separate container or run off into a small drain (what a waste of nutrients!). Diluted 4:1 with water [4 parts urine: 1 part water] so that it won't burn your plants, it is a nitrogen and phosphate rich fertiliser. Removing urine reduces the moisture load on the toilet as well.

The remaining compost solids, when dry, can be spread on the garden like ordinary compost. Ensure the compost dries out completely before putting it in the environment. Also, don't spread toilet compost close to a waterway or bury it where there is low groundwater.

Worms There are a number of "worm farm" composting systems advertised. Don't use them here. PLEASE Why? Because the worms used are all exotic ("Red Crawler" (USA) etc) .. and they are displacing the native worms. It is suggested that the reason our creeks now run muddy after rain (even out of intact forest) is due to worm casts, from "weed" worms – that get dispersed by the rain. You may notice – that after the next rainfall, the creek is just as muddy. Problem is, we have no idea of the real impact these worms have on the environment here.

"Mexican" drains These are heavily frowned on by the authorities. (they'd be terrible in urban communities). however, in the Daintree, most domestic grey water can be drained directly onto the ground in the rainforest. The bacteria and fungi will digest your kitchen, bathroom and laundry waste in short order (it's the basis for the important technology called "Bio-Remediation") – and the resulting nutrients will be taken up by the tree roots, well before they reach the ground-water. Discharge ABOVE the low points on your property (or on your garden). Obviously this would be fine for households – but NOT for bigger users. Their advantage – they use no power and you can use the grey water directly on your garden.

"Bio" Waste Water Systems

Compared with septic systems these systems are more complex and better suited to sites with

low groundwater, poor drainage and/or nearby waterways. They are also more complex to use than compost toilets but seem to be the most common system used here.

All “Bio” waste water systems require CONSTANT (and not inconsiderable) 240V electric power for an air pump, and intermittent power for an irrigation pump. The amount required will vary between systems, but you will need to factor it into your power generation needs.

Fluctuations in your power supply, system overload, insufficient drainage during wet season, and damp weather in general can all damage the system. This means you may need to have the wastewater pumped out [HOW?? WHO?? Approx cost ??]. Consequently, it is recommended you choose a system with as few electronics as possible.

Waste water systems need to be inspected every three months, costing between $320 and $560 p.a., depending on the service provider.

Septic Systems

These systems are low maintenance, require no power supply and are the closest you will get to a town toilet. Of course it requires a good water supply. Unfortunately there are not many places in the Daintree that are suitable for these systems. Waste drainage needs to be a significant distance from ground water, creeks, flood- plains and bores; septic system effluent is only suitable for fruit trees using subsurface irrigation. For the health of the environment and residents, it can not have direct contact between food crops, water drainage lines, or any source of drinking water.

In times of water logging or if harsh chemicals (such as household bleach) enter the system, the necessary microbes [bacteria and fungi] can be overwhelmed or destroyed. This can mean a malfunctioning system and subsequent site contamination.

For existing systems, it is recommended that you get a soil and site assessment to ensure it isn’t causing contamination. Also check the system by turning on all the taps and flushing all the toilets in the house at the same time. If the water is slow to drain you probably have a problem. Fix it.

If you do chose this option and obtain Council approval for installation, determine how much trenching will need to be dug. Be aware that any cut tree roots will eventually grow back into the trench. This is the main cause for septic systems to fail.

Septic System Tips

1. If the system requires microbe inoculation, add some molasses, blood and bone, or specifically designed microbe innoculants [where to get this?].
2. If roots have invaded the septic trench, your plumber may be able to flush the system with Rootox, which will encourage the roots out of the trench. Otherwise the trench needs to be replaced or “Rotor-rootered”.
3. If your system is due to be cleaned (generally every three to five years) or you don’t know when it was last cleared, call the Council [number to call?].

- Austrop Foundation