

Permaculture Cairns November Newsletter

EMPOWERING COMMUNITIES WITH SUSTAINABLE SOLUTIONS



Care for the Earth, Care for people, Share the excess

Permaculture Cairns Incorporated

Web Site: www.permaculturecairns.org.au

November Meeting & Information Exchange Night

Tuesday 17th at 6pm for a 6.30pm start

Meeting Venue: ARC Disability Centre – 92 Little Street Manunda

Members please bring a plate of finger food to share and a friend or two!

Financial Members are free, Non Members \$5 Why not join up only \$10 for singles and \$15 for a household until January 1st 2016

AGENDA

Welcome to new members and visitors

Upcoming workshops and event for this month and beyond

Permaculture Principle Number 10, a practical explanation.

Guest Speaker: Sioux Campbell

“Growing resilience in Cairns”

Queensland’s “summer of disasters” in 2011 highlighted the importance of community preparedness for and resilience to disaster events. Resilience has become an increasingly trendy term, but what is it – and how much of it do we have in the Cairns region? Disaster Resilience Officer with the Cairns Regional Council, Sioux Campbell, will discuss her work in supporting greater resilience, including the results of a recent survey.

Followed by a short Movie that Matter

Then a few brief talks on some of the following topics, Books, Plants, Tools, Tips, Weeds, Pests, Recipes or Gardening Tips of the month. And if you have something to add please speak up.

About 8.15 we break for a cuppa and nibbles and a chance to network with likeminded people.

Check out the books in our Members Library – We are finished and on the way home by 9.00pm **or so.**

Last Month Neil Robson from “Coco Lavish” gave a very interesting outline of how he started Organic Gardening and Neil's Organics which he ran for 10 years. Neil told us about his new venture “Coco Lavish”, what a great name, a new place to eat great fresh food with lots of input from the coconut palm, the tree of life. Neil and his business partner Sasi and helpers, Kylie, Kanan and Clare will look after you. Check it out in Shields Street just around the corner from Grafton Street.

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CAIRNS LOCAL DISASTER COORDINATION CENTRE OPEN DAY

Saturday 5th December

Find out what really happens when our regional disaster coordination centre is activated in this special “look behind the scenes”. Join the disaster management team, Eliminate Dengue, Woree Neighbourhood Watch and emergency services for plenty of giveaways, information, demonstrations and a free barbecue.

Date: 5 December 2015, 9am-1pm

Venue: Cairns Local Disaster Coordination Centre, 61-79 Windarra St, Woree.

Enquiries: Sioux Campbell, 40443377.

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SOCIAL NIGHT INVITATION and ANNUAL GENERAL MEETING

Tuesday 15th December 2015 6pm for 6.30pm start

Venue: West Cairns Bowls Club in Gatton Street Manunda.

After the meeting there will be finger food, cash bar for refreshments and a chance to try your skills at bare foot bowls.

All welcome, Members free, non-members \$20

If you have thoughts of being on the Committee or can help out at events, such as at our big Permaculture Expo Day in May, please contact a committee member.

We would love you to become involved, it is a great way to meet people and to make new friends, while being involved in a noteworthy cause. And it is fun.

URGENT !!!!!!! Please RSVP by 8th December by calling 4054 6324 – leave a message if not answered by a real person.

Nomination and proxy forms are at the end of the newsletter.

Permaculture Principle No. 11

Use edges and value the marginal

"Don't think you are on the right track just because it's a well-beaten path"

The interface between things is where the most interesting events take place. These are often the most valuable, diverse and productive elements in the system.

The icon of the sun coming over the horizon with a river in the foreground shows us a world composed of edges. The proverb "don't think you are on the right track just because its a well-beaten path" reminds us that the most popular is not necessarily the best approach.

Plants of The Month – Ginger and Turmeric

Ginger

In the tropics, ginger grows all year round, the tops die off at the end of winter, but the rhizomes are still there to harvest. These older rhizomes are used to flavour chutneys, curries and beverages. There is no need to harvest all of the plant, just dig up what you need. Although it is best to move the plant to a new area after a couple of years in one spot.

The older rhizomes will starts to shoot again around the end of September. The new young rhizomes are softer and are often called stem or green ginger which can be used in salads, pickled, boiled up in syrup or used to make ginger vinegar for use as a salad dressing.

Ginger likes a moist position with some shade, pidgen pea makes a good companion shade plant. It grows best in a fertile loamy soil with compost and rotted manure given occasionally during the growing season.

Turmeric

Grows similar to Ginger and like similar growing conditions, but doesn't reshoot until November. Once again move it after a couple of year to another location to ensure disease problems don't develop.'

Turmeric is used for curries and as a food dye. Can be boiled and sundried for a week, to be used as a powder when crushed. The young leaves and rhizome tips may be eaten. It is reported that turmeric has anti-inflammatory properties and may haave other useful health properties.

PERMACULTURE CAIRNS – BIODYNAMIC FARM TOUR



Sunday 15th November 2015 Approximate times: 8am to 5.00pm

Venue: Lisa Price & Simon Harden's Farm, Tully Falls Road, Ravenshoe.

HOME GROWN VEGIES, BACKYARD POULTRY, NATURAL ENERGY TOWERS, COMPOST

WHEN: Sunday 15 November 2015

WHERE: 834 Tully Falls Rd Ravenshoe

START TIME: 10am or come earlier for cuppa. Finish around 4pm

BRING: Chair, hat, closed shoes, something to share for lunch. Tea and coffee, plates and cups supplied.

Learn how to grow your own healthy biodynamic food from scratch. What different plant needs are and how to cope with insects and diseases. See how to keep poultry healthy and happy or what to grow for chook food.

After lunch Bob Mathews will give a talk on his natural energy towers. His talk will include; the difference between earth's grids, energy towers and how they work and their benefits, geometry and vibration.

Then we will look at how to create your own fertility, and use and apply compost and biodynamics on the farm or backyard.

Our sell, buy, share table will be available as well.

**Please register your interest in participating in this tour by emailing
info@permaculturecairns.org.au**

We need to know numbers before we decide to car pool or hire a bus, so let us know ASAP

If you intend to come don't forget to bring a plate to share for lunch and ring Carol on 40546324 urgently so we know who is coming.

There is no fee for the farm visit but there will be a fee to cover transport costs.

OTHER LOCAL WORKSHOPS AND EVENTS

Bungalow Community Garden General Meeting

Date: Sunday 15th November 2015

Time: 10.00am

Venue: The Bungalow Gardens on Spence St

Cairns Seed Savers

Cairns Seed Savers is an informal group of individuals with a passion for saving seeds and growing fruit, vegetable and other useful plants that have been passed down through generations and are adapted to our local conditions.

WHEN: Sunday 15th November 2015

WHERE: Jo's place, 39A Clifton Rd, Clifton Beach

PHONE: Jo 40553053

WHAT TO BRING:

- Organically grown, non-hybrid seeds if you have any spare
- A plate of food to share for lunch • Your own chair, plate and cutlery
- Your spare seedlings, cuttings, plants and produce for the Share Table

AGENDA:

10 – 11AM Meet'n'greet, general housekeeping, seed sorting and access to Seed Bank

11 – 12 Talk by Michael Alba on "What to grow in the wet season"

12 – 12:30 Enjoy a shared lunch

12:30 – 1PM "Show and tell" of any of your great ideas/inventions

Tour of Jo's very productive garden

Everyone Welcome - See you there!

L.E.T.S. November Calendar

TABLELAND LETS - Relocalising all of Far North Queensland

LETS is a Community Trading System which uses "Bartles" for trading.

CASSOWARY COAST – Sunday 1st from 9am November Picnic @ Johnstone River Community Gardens.

Garden harvest lunch at noon. NON LETS event however everyone is welcome. Car Pooling advised. EVENT

HOST: Bernie - 0403523244

KOAH & KURANDA – Saturday 7th 3 till 5pm Koah Community Hall, Koah Rd: "Food for thought" shared feast (conscious food and conversation) from 6pm. Film event: "Habitat: a permaculture perspective" from

7pm to 9pm by donation. Bring a plate to share. Car Pooling advised for those who are keen to make the trip from the Tablelands or Kuranda. EVENT HOSTS: Blake and Toddi – 0422068995

MALANDA - Saturday 14th 10 – 12 noon. Malanda trade in the Park. Eacham Memorial Park, opposite the post office. Bring along morning tea to share, something to trade and display your wares. There is a shelter, so it's an all weather event. EVENT HOST: Katrin - 40966755

CASSOWARY COAST - Sunday 15th 10am-2pm LETS x-mas Trade hosted by Kerry McAvory at Mena Creek Car pooling/collection serviced encouraged from the Tablelands and Cairns. Address, creek crossing plan ect TBA. EVENT HOST: Suari – 0403115261

JULATTEN – Monday 16th 10am Trade at Lyn's cozy cottage, 8 Stevens Road Julatten. Bring a morning tea plate to share coffee and tea provided. All Welcome. EVENT HOST: Lyn – 40941431

MALANDA – Saturday 21st 6-9pm Trade Night at Katrin's place, opposite the Malanda Caravan Park. Bring something to trade and a plate to share for dinner. This is a child friendly event and kids can make use of the huge toy room. Event Host: Katrin - 40966755

RAVENSHOE – Saturday 21st 12 - 2pm Trade afternoon Youth Shed, Ravenshoe Community Centre, 3 Bolton Street. Following Community Gardens gathering - come and check it out. Child friendly event. Bring something to trade and some lunch to share. EVENT HOST: Kathy - 40977864

KEWARRA BEACH – Friday 27th 5.30 – 8pm Pre Christmas Trade at Kewarra DOP. EVENT HOST: Ilona - 40578897

YUNGABURRA – Saturday 28th 12 – 2pm - that retro cafe trade afternoon, Red Shed Shops. This event is immediately after the Yungaburra Market and the same weekend as Yungaburra Folk Festival. Bring along something to trade, a rug to display your wares. Retro is extending so there will be plenty of space. 100% Bartles for drinks from the menu (you will need cash for drinks from the display fridge). EVENT HOST: Melitta - 40952340

CAIRNS CITY - Sunday 29th 12- 2pm - Lafew Teahouse, 33 Sheridan Street, Cairns. Bring along a friend and something to trade. EVENT HOST: Lorna - 44205903

Date Claimer: Xmas Event 1st weekend of December - Sun 6th at Yungaburra from 10am-1pm. @ The Rec Shed, Memorial Park, Barrine Rd. Bring your wares to trade. Fun activities, food for Bartles, picnic lunch... LET'S make it such a successful event like in 2014!

What to bring to Trade Events where not specified above: food & drinks for yourself or to share, or money and/or Bartles at some venues, friends, Trading Record Sheet and pen, any goods you wish to trade, table/rug to display them upon is often useful, your own chair at some venues, promotional material of any services you are offering if applicable, \$20 to join LETS if you are not yet a member.

tablelandlets@gmail.com - 4096 6972 - www.tablelandlets.org - www.communityexchange.net.au

NEWS & INFORMATION FROM HOME AND AROUND THE WORLD

From the Resilience newsletter

WHAT IS HAPPENING AROUND THE WORLD IN PERMACULTURE

Permaculture, Climate & Survival

The following link is from the Resilience newsletter and contains a link to Youtube and

"Cool Talk by Albert Bates from The Farm in Tennessee, Albert interviews Transition Towns co-founder, Rob Hopkins and Australian permaculturalist Rosemary Morrow at the 15th International Permaculture Convergence in London in September this year.

<http://www.resilience.org/stories/2015-10-23/permaculture-climate-survival>

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From the Resilience Newsletter

Why COP 21 Matters, and Why I'm Going

by Rob Hopkins, originally published by [Transition Culture](#) | OCT 29, 2015



On Monday we launch our new book '*21 Stories of Transition*' and today we begin our build up to **COP21 in Paris** which starts at the end of the month. Often our default setting as people who are motivated by climate change is to lobby, demonstrate and campaign to try to bring pressure to bear on those decision makers to make the best deal possible. And yes, of course that stuff matters, and there's a lot of it ramping up for COP. But in many ways, the world is already changing, and it's happening at pace, it's fast and it's deep. Are we expecting COP21 to be that moment of fireworks and dancing elephants, a 'Great Change Moment', when people dance in the street and subsequently put plaques up to immortalise the moment for their grandchildren? If we are, we're missing the point.

The Great Change? We're in the middle of it.

If you believe things aren't changing, you're looking in the wrong place. More and more forms of renewable energy, such as onshore wind, are now the cheapest form of electricity in many places. Even the CEO of Shell, Ben van Beurden, **now says** "in the years to come, solar will be the dominant backbone of our energy system". Towns and cities around the world are taking the lead, far outstripping their national governments' carbon reduction targets. The **Bank of England, among others**, are now warning of 'stranded assets' as a result of the 'carbon bubble' with **Governor Mark Carney warning** that losses could be "potentially huge". Prince Charles **recently told a meeting of fossil fuel investors** if they wanted to be remembered as "future makers or future takers". The divestment movement is growing fast, a trend you want to be the first to act on, not the last.



Coal is finished. The US coal industry has **lost 76% of its value in the last 5 years**. The oil industry is increasingly aware that the writing is on the wall, BP for example recently acknowledging that due to concerns about climate change, **it is unlikely now that fossil fuel reserves will ever be fully exploited**. Shell **recently abandoned drilling in the Arctic**, "for the foreseeable future" because it found so little oil. Support in the UK for onshore wind continues to grow, with **a new government survey** finding that 74% of people saying they'd be happy to have wind turbines near them, and only 24% being happy to have fracking, with women, interestingly, **far more likely to be opposed to it**. China aims to **quadruple the amount of solar it has installed by 2020**.

The Pope has spoken out on climate change in a way unimaginable a few years ago, framing climate change as a moral issue, as has the **Islamic Declaration on Climate Change**, and **the Dalai Lama**. Even the G20 leaders have talked for the first time of "phasing out fossil fuels". Even if their proposed deadline, 2100, is actually 70 years too late, it is still important that the language of the end of fossil fuels is now out there and running through our culture.

COP21 is acting as the catalyst for many organisations, businesses and governments to refocus on climate change, move finance into climate change, put pressure on governments to create a stable environment within which to build a low carbon economy. All manner of shifts and realignments are going on behind the scenes. And the politics are changing to accommodate this new worldview, for example I was inspired recently by this piece about **the Global Network of Rebel Cities**. Then there's the rise of Podemos and other movements, and the incredible laboratory for new approaches **that Latin America is becoming**. The ousting of the Harper government in Canada also gives COP21 increased possibilities.

Telling our stories

On Monday, we at Transition Network are publishing a new book called '*21 Stories of Transition*', our contribution to the talks in Paris, which tells, in English or in French, stories from 39 Transition initiatives in 15 countries. When put together, just those 21 stories have, among other things:

- generated 18,527 hours of volunteer input (and that's just from the handful that measured this)
- Put over £1 million of complementary currencies into circulation
- Created 43 new social enterprises
- Reduced car travel equivalent to driving to the Moon and back 3 times
- Saved 7,450 tonnes of CO₂ just through renewable energy installed (enough to power 4,000 homes)
- Begun work on building projects with a value of £5,150,371
- Raised over £13,155,104.88 for investment in renewable energy
- Produced enough boxes of vegetables to feed 550 families a week

And these are just the measurable ones. What of the relationships built, the degree to which people feel more hopeful, skilled, connected, positive, resilient? What are the gardens actually growing? What are the community energy companies actually generating? What are the construction projects actually building? And these are just a fraction of the thousands of Transition groups in now over 50 countries. And these are just a fraction of the wider, diverse, and innovative networks of grassroots responses happening around the world.



1.

THE MILLION MILES PROJECT

IS IT POSSIBLE THAT A BOTTOM-UP, CITIZEN-LED APPROACH COULD ACTUALLY MAKE A SUBSTANTIAL IMPACT ON LEVELS OF CAR USE AMONG A MOSTLY RURAL POPULATION? TRANSITION BLACK ISLE SET OUT TO FIND OUT.

Background
The Black Isle is a peninsula in the Scottish Highlands bound by the Cromarty Firth and the Moray and Beaulieu Firths. Many of its residents work in the nearby city of Inverness, resulting in high levels of car use, and the resultant levels of carbon emissions. When it was announced that the Kessock Bridge, the peninsula's main connection to Inverness, needed repairs which would halve its capacity for cars, Transition Black Isle decided to use it as the opportunity to try and do something about the levels of car use.

About the project
The project was funded through the Scottish Government's Climate Challenge Fund, and co-ordinated by Peter Gilhouse and Martin McDonald. It was launched on 20 August 2012 and began with a baseline survey to get a clear picture of the current levels of transport use before work began. Over the next 3 years it ran a wide range of events and workshops with the support of the local authority and a wide range of other organisations and authorities.

Outcomes

- 5,368 people attended 471 events over 30 months
- 100 people attended a Black Isle Bikefest
- led to 74,196 more miles being walked
- 46% of respondents stated they were now cycling more
- 131,045 more miles cycled as a result of the project
- Black Isle Travel Map distributed to 8,300 households
- Lift Share scheme now has 726 members, 23% of people now lift share more

Challenges
One of the key challenges the team faced was how to measure the less tangible impacts of the project, for example the harder-to-measure benefits of an active lifestyle, and the many positive changes people experienced other than just carbon reduction. Anecdotal evidence shows that during and after the scheme, a deeper cultural shift in attitudes towards lift sharing took place.

Project aim
The aim of the Million Miles project was simple: to cut car use by a million miles (1% of the current total) through promoting greener alternatives. This was done through 3 main approaches: 1) Active travel (walking and cycling), 2) Greener car travel and 3) Public transport.

Other projects: Two community gardens (Loch na Mhòide and Culbokie), an annual Potato Day, practical gardening skills sessions, a bicycle hire enterprise, Black Isle Active Travel Map, community wind energy project, 3 food markets at different locations.

Local population: c. 13,000
Launched: 2012
Other projects: Two community gardens (Loch na Mhòide and Culbokie), an annual Potato Day, practical gardening skills sessions, a bicycle hire enterprise, Black Isle Active Travel Map, community wind energy project, 3 food markets at different locations.

As well as the impacts of the work itself, there was also a longer lasting legacy. The active travel map and route guides are still widely available, many villages

Transition Black Isle

22 Stories of Transition: 17

This can no longer be dismissed as "a few do-gooders making community gardens" (as Transition was once rather patronisingly described to me). This movement of bottom-up approaches, whether it's called Transition or not, is happening everywhere, and it's moving mountains.

I remember COP15 in Copenhagen. I didn't go, but the sense of crushing disappointment it created took the climate change movement many years to recover from. What so many of us were expecting and desperately hoping for was a Great Change Moment, when world leaders and corporations would realise that they had made the most appalling mess of everything, would then embrace with great gusto the opportunity of

creating a more resilient, low carbon, sustainable future and remodel capitalism accordingly. With hindsight, that was a somewhat unrealistic expectation.

When it didn't happen it felt dark and desperate, like the greatest dereliction of duty imaginable. With **COP21** just over 4 weeks away, might it be that a longing for a Great Change Moment means that we are psyching ourselves up for another bout of crushing disappointment?

But those Great Change Moments rarely ever happen, and if they do, they are desperately few and far between. People are **already writing off COP21 in Paris as a waste of time**. It is increasingly clear that it won't result in an agreement that will limit the world's emissions to less than 2 degrees, which is, after all, the point. So it's a waste of time then? I don't think so.

How change actually happens

Change happens in interesting ways. For example, recently, a community campaign where I live challenged a large local charitable landowner's land use decisions, in particular its decision to submit large swathes of land for development. The community campaign questioned the link between the organisation's stated values and its actions. Looking back in hindsight, it's interesting to see how the change unfolded, and how there is no one single Great Change Moment to point to. But at the moment when the then CEO of the organisation was brazening it out, telling everyone how the organisation was listening and responding when it was clear that he really wasn't, actually the ground had been eaten away from under him, and it was empty words, and a month later he had stood down. Events were moving, the world around him was changing, he had been left behind.

Similarly the GDR, East Germany, looked to be robust, powerful and permanent in the days before the Berlin Wall came down. In reality, we now know, it was holed below the waterline, undermined by the number of young people defecting to the West, corruption, rigged elections and much more. But until the Wall came down, you'd never have known. So how can we know, in the moment, which point in time we might point to as the moment when the change actually happened?



What Transition brings to COP21

While Paris looks likely to not be that Great Change Moment, perhaps it is we who need to take a different approach here. Our role in Paris, or during that time, in my opinion, is not to see this event as a Great Change Moment, rather as just yet another important step in the ongoing – and of course massively urgent – building of a new, low carbon world. Instead, we should focus, during that time, on celebrating what is already happening. And there is much to celebrate.

The stories of change outlined above tell us far more about what is already moving than what is thrashed out in a vast, soulless, air-conditioned conference centre. And those trends are growing, building, regardless of what is decided. Rather than give our power away, surrendering the degree to which we believe a low carbon world is possible to the wording of an agreement made between leaders, we need to take it back, to state clearly, loudly and often that it is *they* who risk being left behind here.

Like the local campaign with the landowner I mentioned earlier, what is agreed at COP21 is just a moment in a longer process, a snapshot of a rapidly flowing stream. What is happening beneath the surface, the currents that are set, the infectious nature of ideas, the human disinclination to be left behind and seen as being out of touch, the way that tipping points work, are all really the great unknowns here. And as *'21 Stories of Transition'* shows, we have so much more power in this than we might think we have.



Last year we spoke to Andy Lipkis of Tree People in Los Angeles. He told us:

"Our job is to make viable the alternative and have it ready. If we've really done our homework, we could scale this thing in a flash".

It is to building that viable alternative that I put my shoulder. It is celebrating that viable alternative that will be the focus of my time in Paris in December. I was recently in Hannover, and spoke, along with Germany's Environment Minister, at an event that was that region's 'On the Road to COP21' event. It was fascinating to see how, in those discussions, Transition, and other approaches to bottom-up organising, were a missing piece of the puzzle. They had no idea how to mobilise communities, indeed they recognised that they weren't the people to do it.

COP21 as a historic opportunity

For many years now the fossil fuel industry, and associated industries, have collaborated strategically, using their wealth and power to do everything they can to make sure that we go on emitting carbon. They've been helped in this by the growth delusion, and the connection between economic growth and using energy. If we're going to succeed in moving to a low carbon, resilient and sustainable way of living in the time we have to make a difference, we'll have to be just as strategic as those who want to go on with the status quo. That means seizing opportunities – and COP21 is a significant opportunity to tell the stories that so need to be heard. That's a story of possibility, and economies designed to increase wellbeing both right now and for our children's children's children. There is a win/win/win/win economy to be built here.



Rather than retreating into the cynical view that COP21 is a waste of everyone's time, I would suggest that we see it rather as the opportunity to appreciate and to celebrate a transition that is inevitable, that's already happening and, to quote the late David Fleming, "has the decisive argument in its favour that there will be no alternative".

At COP21 I'll be marching in the Transition Bloc in the Solutions section of the Peoples Climate March on November 29th. I'll be speaking at whatever events I can to tell some of our 21 Stories, and inviting other people to share theirs. I'll be doing whatever I can to share this stuff. We will soon be sharing a calendar of events that will be happening in the city if you want to get involved. And I won't be putting any energy at all into there being a Great Change Moment. What happens is what happens, but something brilliant and historic is already underway, and our message to the Obamas, Camerons and Merkels of this world needs to be that it's *already happening* without them, and they need to support and enable it, but even if they do nothing, it will continue to grow, because it's the future.

Rob Hopkins is the co-founder of Transition Town Totnes and of the Transition Network. This grew out of many years experience in education, teaching permaculture and natural building.

Nepali Farmers Get Renewable Supply of 'Green' Fertilizer

by Kieran Cooke, originally published by Climate News Network | OCT 20, 2015

Concerns about environmental damage caused by costly chemicals and worries about climate change are altering farming methods in the mountains of Nepal.

KATHMANDU, 20 October, 2015 – For centuries, Nepalese farmers have been mixing the dung and urine of their buffaloes, cows and goats with vegetable compost to make solid manure.

But scientists and agricultural development experts have now helped eight “climate-smart” villages in the foothills of the Himalayas to make liquid variants of this traditional organic fertilizer.

Special mixes of dung, urine, water and additives – including leaves from trees in local woods – have been developed over the past two years to help fix nitrogen and other important plant nutrients into the soil. The bio-fertilizers are collectively known as “jholmol”.

Such organic methods are not only good for the soil, they also contribute to the natural carbon cycle, ensuring carbon is sequestered in the earth.

Beneficial microbes

Some mixes of jholmol – such as those containing *leaves from the neem tree* and stinging nettles, and a special *package of beneficial microbes*, called *jeevatu* – also serve as pesticides to control insects and fungal infections.

Yam Presad, who farms just under half a hectare of land in Naubise, a poor village on the floor of a steep-sided valley two hours' drive east of Kathmandu, has been using jholmol for the past year.

“Jholmol does not increase the amount of rice and vegetables I grow, but it saves me having to buy chemical fertilizers, and people like the produce better,” he says.

“The cabbages are not shiny, like they were when we used chemical fertilizers and pesticides, but they taste a lot better. People like the fact that we only use natural products. They regard it as safe food.”

The *Centre for Environmental Policy, Research and Development* (CEAPRED), a Nepal-based NGO, is helping to establish eight “climate-smart” villages in the centre of the country.

Increasingly erratic rainfall is making it more difficult to eke out a living from agriculture. The annual monsoon rains tend to arrive later than in the past, and when the rain does fall it often buckets down in heavy downpours that are interspersed with long dry periods.

Meanwhile, scientists say *temperatures across much of the Himalayan region are increasing* at twice the global average.

Along with the Kathmandu-based **International Centre for Integrated Mountain Development (ICIMOD)**, CEAPRED is encouraging villagers to experiment with new ways of conserving water and new crop-growing techniques that will still give a good harvest, despite the changes in climate.

In Naubise, as everywhere in the deceptively green mountains of Nepal, water is in short supply for both drinking and irrigation.

It is easy for farmers to make jholmol because virtually every Nepalese smallholding has a couple of cows and one or two buffaloes to provide milk and pull the plough.

The **manure is often also used for energy** – shovelled into tanks to make bio-gas, which powers a gas ring in the kitchen. This saves on wood fuel and helps to preserve the precious community-owned forests that still cover the steepest hillsides.

Population pressure has gradually reduced the size of farms in Nepal over the past 50 years. The average size of a family holding today is just 0.8 hectares – and much less in many hilly areas.

Cash remittances

Most smallholdings are unable to provide adequate food or cash income for a family, so, increasingly, rural families depend on cash remittances from one or more sons who have gone abroad to find work.

Some estimates put the number of **migrant workers driven off the land by poverty** at more than three million – about 10% of Nepal's 32 million population.

This year, the farmers of Naubise and hundreds of other mountain villages in central Nepal are even more hard-pressed than usual due to the series of earthquakes in April and May that killed more than 8,500 people and destroyed buildings in many communities.

Small self-help improvements such as jholmol are likely to play a key role in assisting the rural poor of Nepal – and potentially other mountainous countries in Asia – to survive in an increasingly harsh environment and deal with the impacts of climate change. – Climate News Network

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From the Conversation newsletter

Australia's plantation boom has gone bust, so let's make them carbon farms

In the rolling hills of Victoria's Strzelecki Ranges, among paddocks of pasture and potatoes, stands a simple steel monument to the world's tallest tree. The tree itself, which stood a mighty 115 m tall, was chopped down in the 1880s so that a registered surveyor could measure it.

Almost a century and a half later, Australia's attitude to its forests is seemingly no less perverse.

Not chopping it down might have been a more fitting tribute. Author provided

Not far north of where the tree once stood is the Latrobe Valley, dominated by some of Australia's most carbon-intensive coalmines and power stations. Covering much of the surrounding hills are timber plantations, which store tonnes of carbon. Plantations can be used to soak up emissions – except the current rules don't officially recognise this.

Intensive plantations don't count as carbon sinks under Australia's [carbon farming rules](#). The boom that led to the creation of almost a million hectares of new plantation timber died with the global financial crisis - but with a bit of smart thinking these could be put to use as carbon farms, rather than being allowed to die off and returned to pasture.

Boom and bust

The see-sawing fortunes of Australian forestry have largely been driven by government policy. The 1990s saw major policy reforms, which spawned protests (including log trucks [blockading the national parliament](#)) and ultimately resulted in a widespread expansion of timber plantations.

The area of eucalyptus plantations grew from almost nothing in 1998 to about 1 million hectares by 2008, spurred by a massive influx of finance encouraged by the [Managed Investments Act \(1998\)](#), which turned plantations into tax-effective investments.

But then came the global financial crisis, which saw Managed Investment Scheme (MIS) companies like Timbercorp and Great Southern Plantations go bust. Shareholders and investors lost out, but the plantations themselves were in the ground.

Since then, plantation ownership has been [consolidated](#) into the hands of a few dominant players such as [NewForests](#), which acquired more than 700,000 ha, and [Global Forest Partners](#) (more than 150,000 ha).

An expensive experiment

Some MIS plantations were poorly sited, in terms of climate and soils, used inappropriate species, or suffered pest or disease problems. Some have been written off, bulldozed and returned to pasture. Many more are likely to be.

Current estimates suggest that a third of the eucalyptus plantations are uneconomic with harvesting unlikely, another third will probably be harvested but are unlikely to be replanted. The rest will form Australia's future hardwood estate. In this sense it has been a massive and expensive experiment.

This story shows the power of financial incentives, but reflects the problem of using tax inducements to fund an industry. For investors, tax deductions became the primary goal, rather than the quality of the investment.

The plantations' boom and bust, with its focus on using fast money for fast-growing eucalypts, mostly for pulpwood, has obscured other important opportunities.

First, it shifted the focus away from the opportunities of [integrating forestry into farming systems](#).

Second, the reputation of Australian forestry and forestry investments has almost certainly suffered.

Third, it may have blinded us to the potential of using Australia's rich diversity of tree species for other purposes. Australia's genetic gifts to the world include trees that grow prolifically in poor soils, can withstand fire and drought, store carbon, and produce hard, strong, richly coloured timbers.



A treasure trove for carbon farmers. [T. Grove/CSIRO/Wikimedia Commons](#), [CC BY](#)

Already planted across millions of hectares throughout the world, Australia's eucalypts, acacias and casuarinas offer a genetic treasure trove for carbon farming.

With much to learn about Australia's diverse and productive flora – including how to farm it for carbon – it seems perverse that investment in Australian forestry research and education is now declining.

Carbon crops

Carbon markets and emerging technologies could fundamentally alter the way we conceive of trees as crops.

With a million hectares of eucalyptus plantation approaching maturity, there is almost certainly an active search for commercial markets for the standing timber - as wood fibre, for bioenergy fuel, or for non-wood products.

Nonetheless, large areas are likely to be reconverted to pasture, resulting in less carbon being stored in these landscapes. But there's another, even simpler option for what to do with these plantations.

Perhaps it is time to reconsider whether to credit the carbon captured by these trees, given that their plantings were sponsored by our taxes. Changes to the carbon farming rules might make these and other multi-use plantations more viable.

The Australian Forest Industry estimates that Australia's Kyoto-compliant forestry plantations (those established on cleared land since 1990) offset about 4.5% of Australia's total emissions, but these are not credited under Australia's [Carbon Farming Initiative](#).

There are [no approved CFI methodologies](#) for plantations that sequester carbon and produce commercial timbers, but if there were, multipurpose plantations could form a key plank of Australia's Direct Action carbon abatement policy.

In addition to carbon, there is potential for plantings that deliver economic development and ecological benefits in terms of restoring landscapes. But new models of plantations are needed, supported with different policy setting that drive their development.

Any large-scale bio-energy or carbon plantings in the future need to heed the lessons from Australia's plantation boom and bust. In emerging carbon-constrained economies, how we define resources in rural landscapes, including carbon credits, will literally shape our future.

From the Biochar Journal

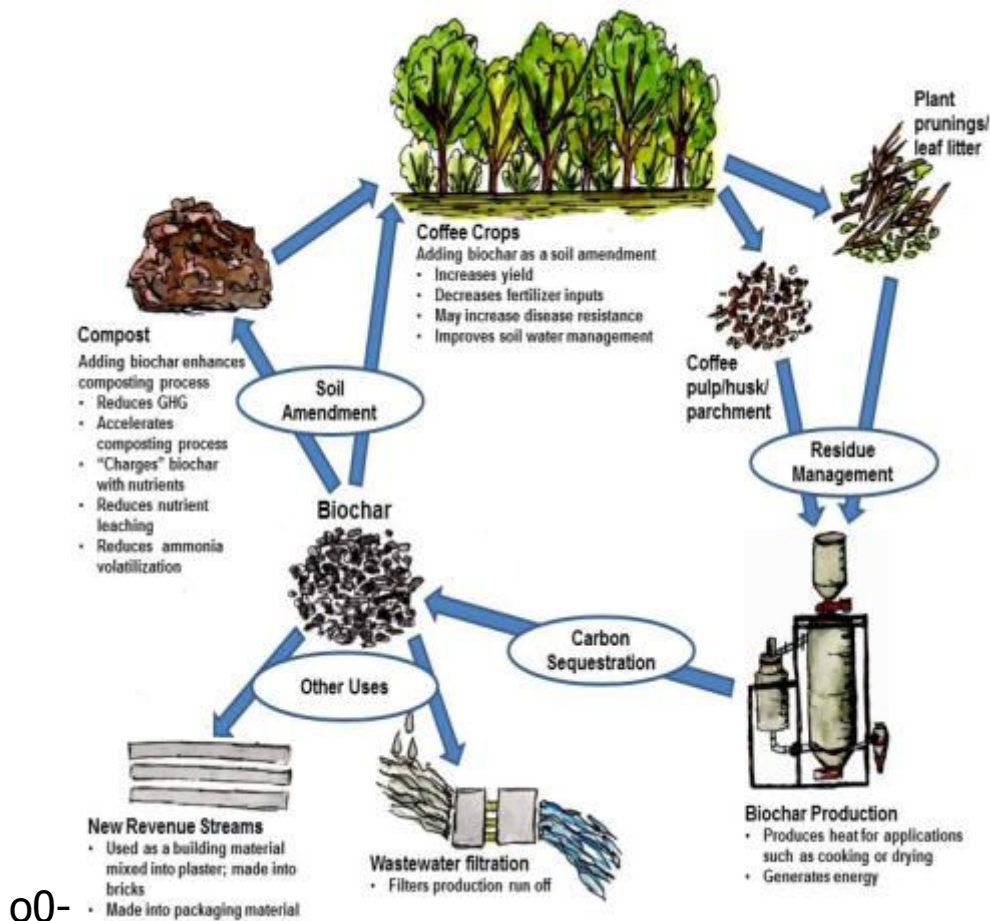
Healthy, fertile soils with the planting of trees and crops, with recycling organic nutrients, and biochar captured carbon

Trees not only produce timber but animal fodder, nuts, fruits, pharmaceuticals, essential oils... but shade, nitrogen and carbon. No heavily degraded soil can be regenerated and made fertile again without the planting of trees which will help to recycle scarce water and activate soil biology.

Agro-forestry systems are not dense forests but should be seen as crops that transform the surface of an agricultural field into a much more efficient multistory eco-system. The trees provide understory surface for annual ground crops while the mid- and overstory grows with perennial crops. Adapting to the effects of climate change, such agro-forestry systems are not only much more resilient than traditional field agriculture but provide much higher food and economic security especially in the tropical and subtropical regions. However, to establish highly productive agro-forestry systems on degraded land and especially in dry climates, a systematic approach, which considers ecological, economic and cultural aspects, is necessary. While the main technical methods to establish agro-forestry systems even in the Sahel have been proven by now, the main challenge is how to implement it socially into existing farming practice. Farmers will not only have to learn new practices, but also see for their own eyes the actual benefits and understand how these changes can improve their family's lives in a material way. Only then will they be convinced to adapt their entrenched agronomic practices and assure the long-term success.

Using a farm scale device to carbonize crop waste, animal bones, invasive shrubs and later also agro-forestry residues, a substance called biochar can be produced. Biochar is a highly porous material that can be enhanced with nutrient rich organic liquids like animal or human urine to become a highly efficient organic fertilizer. The biochar holds the organic nutrients in place and prevents fertilizing substances from leaching and being lost. Thanks to this method the amount of applied fertilizer can be reduced, mineral fertilizer can be replaced and crop yields substantially increased. Farmers can thus produce their own fertilizer becoming increasingly independent from imported fertilizer and pesticides.

Thanks to biochar based fertilizer and soil substrates plants not only grow better and are more resilient during extended dry periods, it also increases the plant survival rate especially during reforestation of degraded land. Thanks to improved tree growth, one kilogram of biochar carbon can lead to the capture of an extra 40 kg of atmospheric carbon which is marketable in the form of carbon credits as a global commodity and could provide extra income for farmers in addition to all the economic and ecological advantages of climate farming systems.



How Biochar Can Improve Sustainability for Coffee Cultivation and Processing

by Kathleen Draper and Thayer Tomlinson

The Authors

Kathleen Draper is the US Director of the Ithaka Institute. The Ithaka Institute for Carbon Intelligence, which was founded in Valais, Switzerland, with its American branch in an office in Rochester, NY, is dedicated to research, education, and consulting related to closed loop biochar solutions which can be implemented in both the developing and developed world. They are the editors of the Biochar Journal and the developers of the Kon-Tiki Kiln, biochar plasters, and sustainable packaging made from biochar.

Thayer Tomlinson is the Communications Director for the International Biochar Initiative. IBI is a non-profit organization that promotes good industry practices, stakeholder collaboration, and environmental and ethical standards to foster economically viable biochar systems that are safe and effective for use in soil and as a climate mitigation tool.

Potential Benefits of Biochar in Coffee Supply Chain

- Improved coffee yield
- Higher fertilizer efficiency
- Improved water and nutrient retention
- Improved transplant survival rates for young coffee plants
- Reduced deforestation through use of coffee residues in lieu of trees for cooking
- Reduced air pollution related to burning coffee residues
- Reduced water pollution related to release of coffee and fermentation residues
- Improved composting of coffee pulp
- Renewable energy for drying, roasting
- Increased economic development opportunities using biochar based products

Links to a few coffee & biochar projects:

Ethiopia: KaffaKocher project

Kenya: African Christians Organization Network (ACON)

Peru: Pulpa Pyro Peru

Rwanda: Black Earth Project

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There are many more fascinating articles on Biochar in the Biochar Journal. If you have an interest in biochar it is worth a look. <https://www.biochar-journal.org>

Here is a short extract of one article –

Kickstarting Compost with Biochar

If you look at a list of things biochar is supposed to do in soil, you'll find it is very similar to lists you see for compost. Both biochar and compost are said to provide these benefits, taken from various claims made by biochar and compost manufacturers:

- Improves tilth and reduces soil bulk density
- Increases soil water holding capacity
- Becomes more stable by combining with clay minerals
- Increases cation exchange capacity (CEC - the ability to hold onto and transfer nutrient cations: ammonium, calcium, magnesium, and potassium)
- Improves fertilizer utilization, by reducing leaching from the root zone
- Retains minerals in plant available form
- Supports soil microbial life and biodiversity
- Helps plants resist diseases and pathogens
- Helps plants grow better in high salt situations
- Adds humus carbon to the soil carbon pool, reducing the atmospheric carbon pool
-

If compost really can do all these things, why do we need biochar? The answer is twofold:

First, unlike biochar, compost is quickly broken down by microbial action in soil over months to at most, decades, depending primarily on climate. Biochar lasts at least ten times longer in most soils. Recently, I called a California agriculture extension agent with a question about adding compost to fields to improve water holding capacity. I was told that because of the hot climate, at least two applications a year are needed to maintain enough soil organic matter to make a difference in water holding capacity. Aside from the expense of applying that much compost, there is simply not enough compost available to support such large application rates.

Second, biochar has important synergistic effects when added to compost. Researchers find that biochar makes faster, more nutrient rich, more biologically diverse and more humified, stable compost. Below, I examine several of the most important biochar effects and summarize some recent research results.

1. Biochar keeps compost moist and aerated, promoting increased biological activity.

The composting process is governed by various physical parameters that are subject to alteration by the addition of biochar materials as bulking agents. Some of the parameters that most affect compost are: aeration, moisture content, temperature, bulk density, pH, electron buffering and the sorptive capacity of bulking agents. Water and air are both held in biochar pore spaces and voids, and the spaces between particles. Moisture is also the vehicle for bringing dissolved organic carbon, nitrogen and other plant nutritive compounds into contact with biochar surfaces where they can be captured. Biochar's stable carbon

matrix accepts electrons from decomposing organic compounds, buffering electric charges that might otherwise impair microbial activity and be responsible for the production of greenhouse gases like methane and hydrogen sulfides.

All these properties of biochar promote microbial activity in compost. For instance, Steiner et al (2011) tested 5% and 20% additions of pine chip biochar to poultry litter compost, and found that the addition of 20% biochar caused microbial respiration (measured as CO₂ emissions) to peak earlier and at a higher level than either the 5% or 0% biochar treatments.

2. Biochar increases nitrogen retention

When nitrogen-containing biomass materials decay, they can release large amounts of ammonia.

Ammonium (NH₄⁺) is the aqueous ion of ammonia. Ammonium is generated by microbial processes and nutrient cascades that convert nitrogen from organic forms found mainly in proteins and nucleic acids into mineral forms (ammonium, nitrate and nitrite) that can intermittently be converted by nitrifying and denitrifying microbes to gaseous emissions that include volatile ammonia gas (NH₃), nitrogen gas (N₂), nitrous oxide (N₂O) and other reactive nitrogen gases (amines and indoles). At neutral pH, the aqueous ammonium (NH₄⁺) and the gaseous ammonia (NH₃) are in equilibrium. Higher pH forces more of the aqueous ammonium into the gas phase that can escape to the atmosphere.

Numerous studies have shown that biochar is effective at retaining nitrogen in soils (Steiner et al, 2008; Clough et al, 2013). Several studies have also shown that biochar enhances nitrogen retention in compost, reducing emissions of ammonia and increasing total nitrogen retention by as much as 65% (Steiner et al, 2010; Chen et al, 2010; Huang et al, 2014). The ammonia retention ability of biochar can actually improve during the composting process. Adding 9% bamboo charcoal to sewage sludge compost, Hua et al (2009) tested sorption of ammonia on biochar during composting and found that while ammonia retention was correlated with saturation of binding sites in fresh bamboo biochar, this did not hold for composted bamboo biochar. During composting the biochar is subjected to an accelerated aging process. That means that biochar surfaces get oxidized and enriched by carboxylic (acid) functional groups. The latter more than doubled at the end of the composting period, improving the capacity to exchange cations like ammonia.

3. Biochar improves compost maturity and humic content

Several studies have looked at effects of biochar on the timing and results of compost maturation and found that adding biochar to compost reduced the amount of dissolved organic carbon (labile carbon) in mature compost while increasing the fraction of stable humic materials (stable carbon). Following the addition of 2% biochar to compost, Jindo et al (2012) recorded a 10% increase in carbon captured by humic substance extraction and a 30% decrease of water-soluble, easily degradable carbon. They also found an increase of fungal species diversity in the mature biochar compost as compared to the control and proposed that these fungi were responsible for the increased humification. Another study by Zhang et al (2013) found that sewage sludge composted with wood biochar had up to 30% more humic substances than the control.

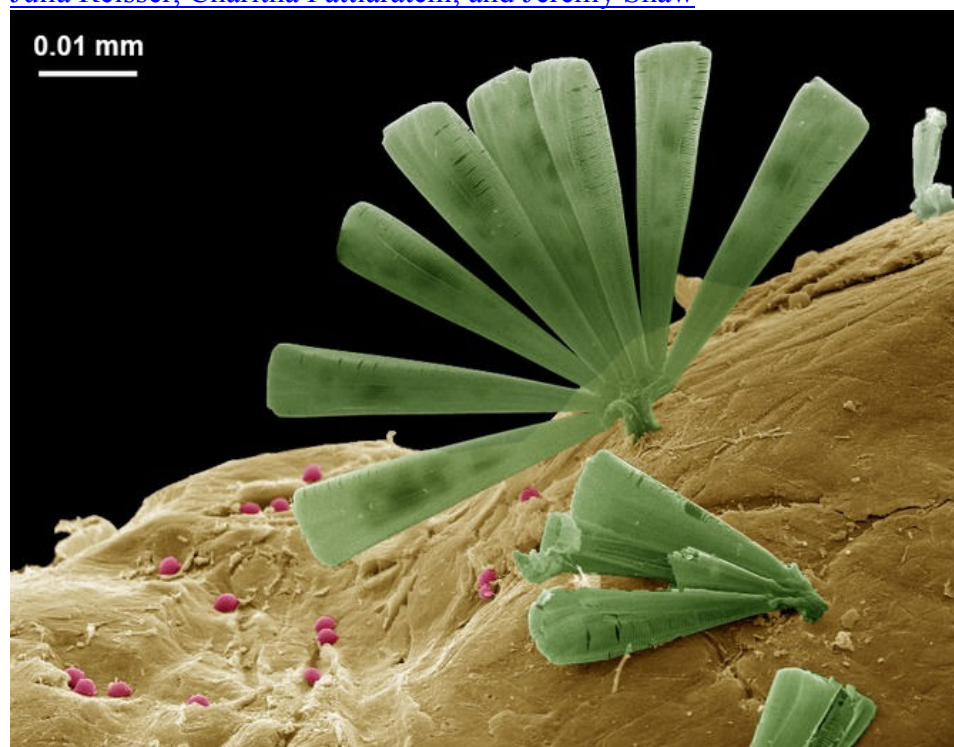
4. Biochar compost improves plant growth

Biochar seems to improve the composting process, but how do plants like those biochar-composts? Several researchers have experimented with various combinations of compost and biochar added as separate amendments (Fisher & Glaser, 2012; Liu et al, 2012). These studies found improved plant growth response when biochar was added to soil along with compost. A 2013 study in Germany looked instead at biochar composted together with other materials. Schulz, et al (2013) tested six different amounts of biochar in compost, from 0 to 50% by weight, and also three different application rates of each compost type. Using oats in greenhouse pots on two different substrates (sandy soil and loamy soil), they found that plant growth increased with increasing application rates of each type of biochar compost, which is not surprising since the amount of deliverable nutrients was increased, at least by the compost fraction. However they also discovered that plant growth was increased as the amount of biochar in the compost increased. The biochar may either have improved nutrient retention during the composting process with subsequent enhancement of nutrient delivery to plants, or it promoted plant growth through some other mechanism. However, the researchers confirmed that synergistic effects can be achieved by adding biochar to composts.

Creatures living on tiny ocean plastic may be cleaning our seas

June 19, 2014 7.00am AEST

[Julia Reisser, Charitha Pattiaratchi, and Jeremy Shaw](#)



Diatoms (green) and bacteria (pink) living on ocean plastic. This is a false colour SEM image of part of the surface of a 5mm long plastic (yellow) from waters off eastern Tasmania, Australia. Julia Reisser and Jeremy Shaw

We know that [Australia's waters contain lots](#) of tiny pieces of plastic, and that these pieces can harm many marine species. But in [new research](#) published today we show that these microplastics are also home to marine life, some of which could be helping to clean up the oceans.

In [earlier research](#) reported on The Conversation we found Australia's waters contain around 4,000 plastic pieces per square kilometre.

Since then we've been looking at the tiny lifeforms found *on* tiny plastic, in the first Australian study of its kind. Our [results](#) are published today in PLOS ONE and data repository [Figshare](#).

Full of plastic

Our growing plastic production and waste, the obstacles to recycle and properly discard plastic products, and the sharp rise in the number of ships and coastal developments, are all leading to an increase in the number of plastic items being lost or discarded at sea.

Ocean plastic debris, such as [throw-away packaging](#) and [fishing gear](#), breakdown into progressively smaller pieces mostly through the effect of heat and sunlight. As a result, most of the plastic floating on our oceans are fragments less than 5 millimetres across – the so-called “microplastics”.



Seawater sample containing microplastics and seaweed pieces. These were collected by Julia Reisser and her crew during the 3rd expedition of the The Ocean Cleanup Foundation - theoceancleanup.com Winston Ricardo

Tiny plastics are widespread across all oceans, with hotspots occurring at surface waters of the Mediterranean Sea and at large oceanic areas known as “garbage patches”. Plastic concentrations at these hotspots can exceed [100,000 pieces per square kilometre](#).

Ocean plastics contain harmful substances that come from the [plastic itself](#) and from oily pollutants that [stick to their surface](#). Plastic toxins can be carried across marine regions and transferred from ingested plastic to animals such as [tiny fish](#) and [whales](#).

Microplastics can also physically hurt and kill small ocean creatures, such as [baby turtles](#) and [invertebrates](#). They also [transport ocean-going creatures](#) to new habitats, potentially impacting local ecosystems.

Welcome to the “Plastisphere”

Scientists first discovered that microplastics are home to life in 1972, when two Science papers reported microorganisms living on 0.1-5 millimetre long plastic from [coastal](#) and [oceanic](#) waters of the North Atlantic.

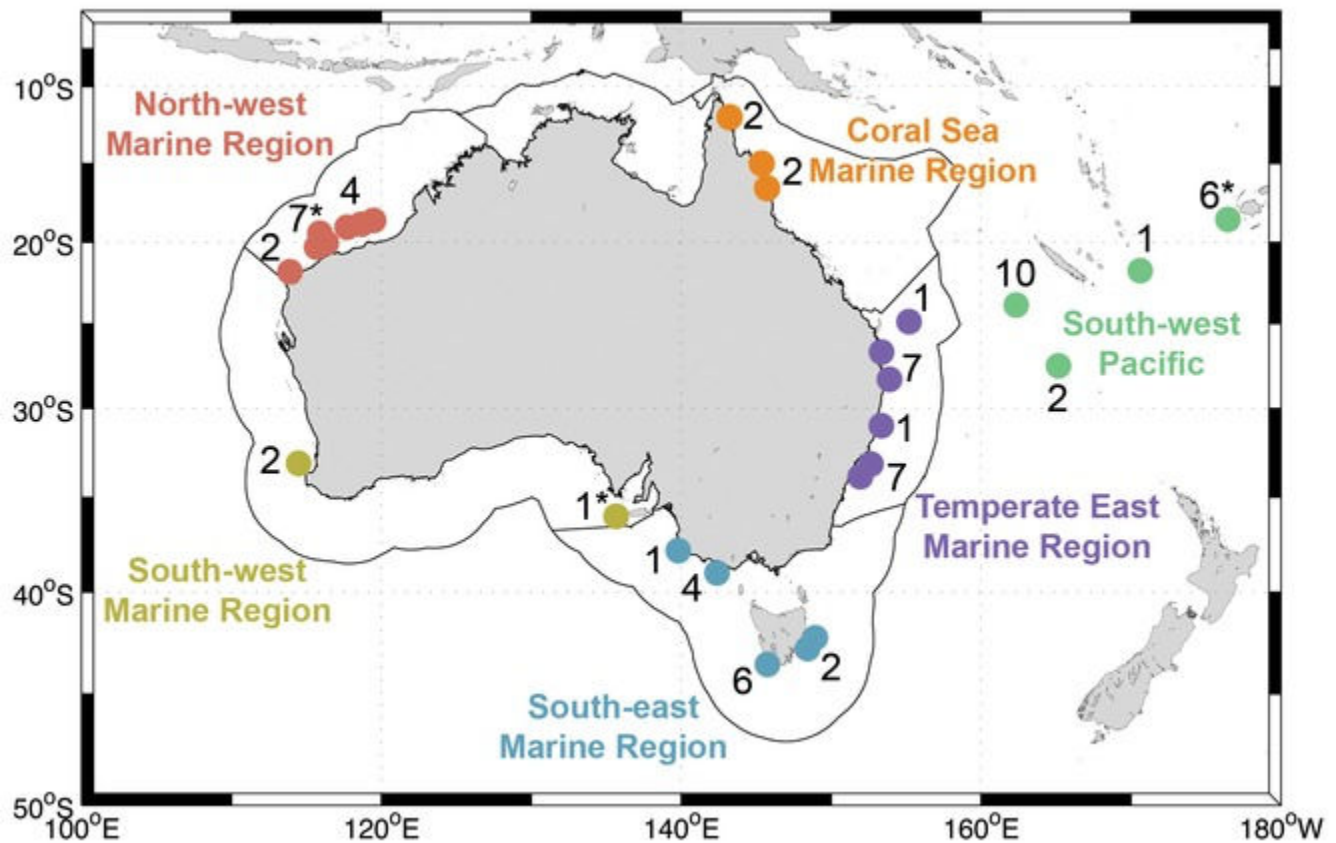
Further at-sea studies on plastic-dwellers only emerged in the 2000s. A pioneer study analysed six plastic pieces from the North Atlantic and found a diverse and complex community of microbes. The researchers called this realm of life the “[Plastisphere](#)”.

These plastic-dwellers seem to play important roles in determining the fate and impacts of plastic pollution. For instance, they appear to modify [how fast plastics break down](#) and the [buoyancy](#) of plastics. Pathogens such as [viruses](#) may also inhabit debris and infect animals that ingest the plastic.

But we still [know very little](#) about the dwellers of the widely-dispersed and abundant millimetre-sized microplastics.

Tiny creatures...

Aiming at improve our knowledge of tiny ocean plastic-dwellers, we decided to take a closer look at 68 plastics we collected in waters from around the Australian continent using a powerful microscope called a [Scanning Electron Microscope](#).



Sampling locations of the 68 plastics analysed in our study. Black lines delimit marine regions of Australia; dots indicate areas where plastics were collected; numbers represent how many plastics were taken for scanning electron microscopy analyses. PLOS ONE

The tiny plastics we examined had a broad range of surface textures that formed tiny ideal habitats for many species. Every piece we examined, which were between 1.5 and 24 millimetres long and made of polyethylene and polypropylene materials, were harbouring a number of lifeforms from a variety of species.

Our study shows that these microscopic plastic-dwellers are everywhere in our oceans. Creatures ranging from single-celled microbes to invertebrate animals are all taking advantage of this new human-made type of floating habitat.

Surprisingly, we found a few tiny animals on the plastics we examined. These included [bryozoans](#), [barnacles](#), a [worm](#), an [Asellota isopod](#), and eggs of the sea-skating insect [Halobates](#).



False-coloured electron micrograph of an isopod on a tiny fragment of Styrofoam cup. Julia Reisser and Jeremy Shaw



False-coloured electron micrograph of a marine worm on a 6mm plastic fragment (polyethylene). Julia Reisser and Jeremy Shaw

Even though plastic-dwelling animals are less frequent and diverse than those living on large marine debris, ecological implications of this phenomenon may still be significant. For instance, tiny plastics are giving sea insects a place to breed out on the [open ocean](#).

Our study also provided the first identifications of [coccolithophore](#) species attached to plastic. These are tiny algae enclosed by calcium carbonate plates that inhabit the sunlit zone of the ocean. Interestingly, we only observed them on plastic debris from southern Australia. As such, further studies in Australian temperate waters may help better understand this unusual coccolith-plastic relationship.

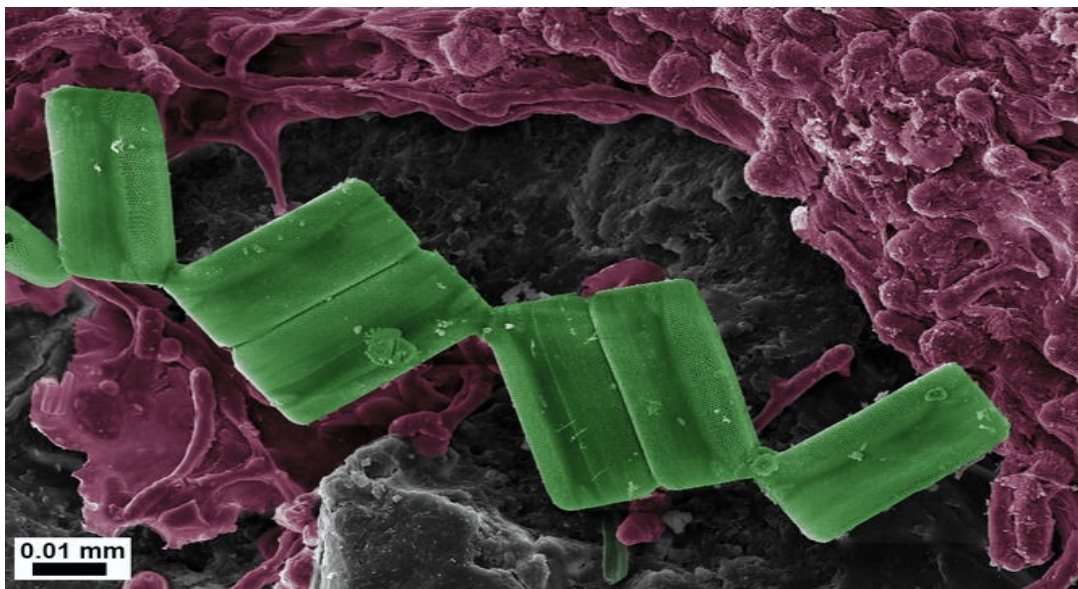


Coccolithophores and diatoms on the surface of a microplastic from South-west Australia. Julia Reisser and Jeremy Shaw

...big impacts

We also found evidence to suggest these tiny creatures can have big impact on what happens to plastic in our oceans.

[Diatoms](#), which are tiny algae enclosed by a heavy capsule made of silica, were the most diverse and abundant group we observed. With the help of [Prof. Gustaaf Hallegraeff](#), we were able to identify 14 diatom genera living on the tiny plastics, of which 11 were new records of plastic-associates.



Diatoms (green) and potential 'plastic-eater' microbes (purple) on a tiny plastic debris. Julia Reisser and Jeremy Shaw

These diatom species are known to live attached to natural hard substrates such as sediments, rocks, and vegetation. Marine plastics thus create a new, floating habitat for these organisms, in a perfect light-filled environment.

Because of their rapid growth and production of nutritious substances, these diatoms may provide food to some marine animals. As their plastics hosts can contain toxins, it remains unclear if such feeding activities would have a positive or negative impact on the animals involved in this new type of [food web](#).

Diatoms growing on ocean plastics may also decrease the amount of plastic at the sea surface. Large numbers of these silica-forming algae can weight down their plastic host, potentially causing tiny pieces to sink to the bottom of the ocean. Such a "plastic sinking" process could be one of the reasons why the plastic load floating in the ocean is [not increasing](#) as much as expected.

Many flourishing microbes appear to interact with the plastic surfaces we examined. These observations, together with findings from [previous studies](#), suggest that microbes are helping to break down plastics at sea. This could be another explanation for the less-than-expected level of plastic pollution at surface waters.

Plastic-eating microbes may also support [biotechnological solutions](#) for better plastic waste disposal practices on land. Perhaps in the future, we may come up with industrial "composts" that can break down our plastic waste.

-0o0-

From The Conversation Newsletter

Microbes: the tiny sentinels that can help us diagnose sick oceans

November 3, 2015 4.01pm AEDT

Authors, Katherine, Dafforn, Emma Johnston, Inke Falkner and melanie Sun

Microbes - bacteria and other single-celled organisms - may be tiny, but they come in huge numbers and we rely on them for clean water, the air we breathe and the food we eat.

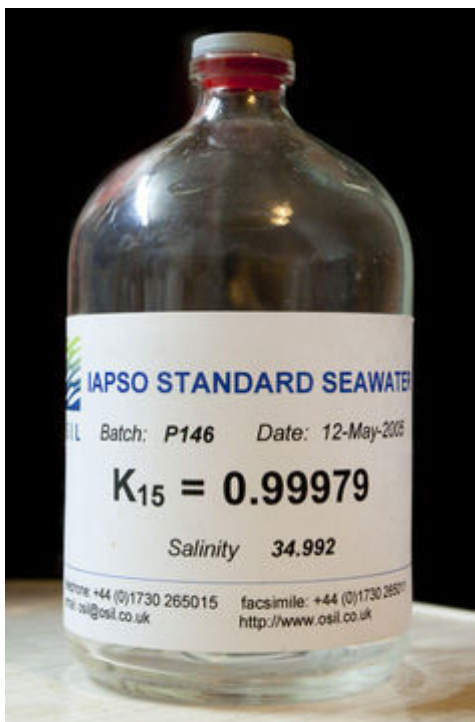
They are nature's powerhouses but they have often been ignored. We previously lacked the capacity to appreciate truly their diversity, from micro-scales right up to entire oceans.

[Recent advancements in genetic sequencing](#) have revealed this diversity, and our research, [published in Frontiers in Aquatic Microbiology this week](#), shows how we can use this information to understand human impacts on an unseen world – making microbes the new sentinels of the sea.

A sea of microbes

The great majority of bacteria and other microbes are [extremely beneficial](#), performing vital roles such as recycling nutrients.

The number of bacteria on Earth is estimated at 5×10^{30} (or 5 nonillion, if you prefer), and [many of them live in the ocean](#). There are [5 million bacteria in every teaspoon](#) of seawater, and more bacteria in the ocean than stars in the known universe.



Guess how many microbes? [Victor Morozov/Wikimedia Commons](#),

[FAL](#)

There are yet more bacteria in the world's soils and sediments, with estimates of [between 100 million and 1 billion bacteria per teaspoon](#). These sediments are vital for [recycling nitrogen](#), particularly in coastal sediments closest to human populations. Without bacteria and other microbes, sediments would turn into unsightly, pungent piles of waste.

Microbial services are not limited to recycling. Many microbes, including cyanobacteria, function like tiny plants by using sunlight to produce oxygen and sugars. Due to their extraordinary number in the world's oceans, the amount of oxygen these organisms produce is [equal to that of all plants on land](#).

Marine sentinels

Until recently, finding out just how many different types of microbes there are was relatively difficult. How do you identify and study millions of different organisms that are not visible to the naked eye?

Bacteria, for example, had to be grown in the laboratory in large colonies to be seen. But [only 1-3% of bacteria can be cultured successfully](#).

Advances in genetics together with the development of molecular tools have allowed researchers to investigate marine bacteria in their natural environment. Microbial communities can now be grouped by [the role they play in ecosystems and how these groups respond to environmental gradients](#).

We can use these new tools to [measure ecosystem health](#), which is crucial to managing human impacts on our coastlines, particularly in estuaries. Early studies have found shifts in bacterial community composition to be [good indicators of contaminants](#)

[Different areas of harbours](#), such as Sydney Harbour, have distinct bacterial communities. These patterns may be driven by circulation. The outer harbour, which is flushed with seawater on every tidal cycle, is dominated by photosynthetic cyanobacteria. The upper harbour, with less flushing and more runoff, is dominated by soil-related bacteria and those adapted to nutrient-rich environments.

In our waterways, pollutants such as metals [bind to fine particles and settle as sediment](#). This exposes sediment-dwelling organisms to a multitude of toxic products. What effect do these toxic substances have on sediment microbes?

Recent evidence from a large survey of eight estuaries suggests that [microbes are far more sensitive to contaminants than larger animals and plants](#). This survey also revealed that toxic substances were linked to changes in community structure and a [reduction in community diversity](#). This is especially alarming given that a diversity of microbes is essential to nutrient recycling.

Diagnosing wounded seas

It would be great if we could use particular microbes to diagnose human impacts. For instance, certain microbes can indicate water quality.

A technique called [metagenomics](#) is revealing the true depth of microbial diversity by pooling DNA sequences from all the species in a sample. It then works backwards to construct a genetic overview of the entire community.

However, while metagenomics can give us important information about the identity of microbes in a community, it can't tell us what they are doing or how their functions change in response to environmental stressors and human activities.

[Metatranscriptomics](#) takes the sequencing approach one step further and characterises gene expression in a microbial community, which can be linked to crucial ecosystem services such as nutrient cycling.

Similar to their use for diagnosis of ailments in humans, molecular tools are being used to diagnose human impacts on earth by observing changes in microbes across polluted and unpolluted environments. They can even detect very small amounts of toxic substances. Because of their diversity, they can potentially be used to detect a [wide range](#) of human impacts.

This allows us to identify environmental impacts early, potentially limiting greater loss in larger organisms.

With the new tools to “see” microbes and their importance, we are now perfectly poised to advance our understanding of how microbes are responding to environmental change. They are sentinels of our increasingly human-affected waterways.

Look what is happening in the USA (some good news for a change)

From: the Resilience Newsletter

Downtown San Diego City College Farm 'Not for Hobby Gardeners'

by [AJ Hughes](#), originally published by [Yardfarmers blog](#) | OCT 15, 2015

Editor's Note – San Diego City College has a sustainable urban agriculture program, complete with an outdoor classroom in the form of an urban farm!

This article was originally posted on [Seedstock](#) and written by [AJ Hughes](#).

Urban agriculture is thriving in San Diego, thanks in part to [Seeds@City Urban Farm](#), a working farm in downtown San Diego that serves as an outdoor classroom for San Diego City College's sustainable urban agriculture program.

Seedstock caught up with Damian Valdez, an urban farmer at the downtown San Diego farm, to see how the farm has progressed in recent years and what's in store for it in the future.



Sunflower in a garden on the San Diego City College campus (Photo Credit: [Paul Sullivan](#))

Have you been able to boost production on the farm? If so, how?

We've been cataloging everything and collecting data because we've been expanding. We went from a garden setting into being more production-focused. What makes it difficult for us to keep the numbers as accurate as possible is that I'm only paid 25 hours to be there. So even though we try to weigh everything

that leaves the farm, we're not always able to harvest everything off the farm. So for us, making sure that we get things to market is rather difficult. Sometimes we're losing a lot of poundage that just goes back into compost or gets donated.

Unfortunately, we don't have accurate numbers as to how much we're producing on our parcel just yet. We're hoping within the next year that we can take the numbers and start looking at them more critically. We also want to look into water usage and land availability, so that we can start looking more critically at what we can expect to be producing within our size limits.

What types of crops are grown at the farm?

We grow different seasonal produce. We strive to stick within the seasons—San Diego is one of those places that's famous for being able to grow everything year-round. We still try to stick with a seasonal rotation though, so that people can get to see what different types of seasonal produce are out there. We also do this from a pest management perspective—when we grow seasonally, we don't have to worry about certain types of pests and insects coming and going. We also have a variety of fruit trees—most of them are stone fruits.

How do you decide what to grow? How do you determine growing methods?

We grow as intentionally as possible. We've developed a few different ways of planting. We use 8-inch strip tape and measure everything out using either 8- or 16-inch bunting. So if it's something that's bigger and needs more space, we use 16 inches; if we need something smaller, we go about 8.

We try to emphasize different and practical ways of using tools. We want students to use something inexpensive when starting their business, to begin to optimize their potential yield, as opposed to something that wastes more seed, such as a dowel method. What we do is try to emphasize the value of a single seed. If we're using new, high-quality seeds, then we shouldn't have to plant three seeds to a hole, hoping one of them germinates.

How has the farm progressed since its beginning? What is its impact on students and the community?

The Seed@City Urban Farm started out as a community endeavor with San Diego City College and San Diego New Roots. It then became an academic program in 2011 (the farm was started in 2008). When it became an academic program, the whole focus started to shift. Until this past year, the college has not provided us with any budget, so we've had to go it alone. That's one of the things that makes the farm so special and makes the students the caliber and quality that they are. Nothing's been handed to us—we've had to work for everything every step of the way. That includes being part of the college campus.

This spring we'll actually get a full-time person, which means our program will be permanent at San Diego City College. That impact is going to be huge for the entire region. We've had some of the highest success rates in the county with our students going on and getting jobs and actively participating in the food system—whether that's starting their own farms or working at agriculture-related jobs. We just finished our most successful semester, with two people starting their own farms, and we had about 12 people get jobs over the summer. That's a high success rate for us. That was mostly students who were in their first semester who were able to go out and get jobs in the field, based on the quality of their education. That's been really good.

What we're looking forward to is the longevity component—knowing we will be around with the college for quite some time, and knowing how that's going to affect the region. Students who are on a four-year track with our college can transfer to Cal Poly Pomona (or similar institutions).

What has been the level of student interest?

We definitely get a lot of people. As a community college, we get a huge range of individuals in terms of age and experience. We get people coming straight out of high school who think this might be a good idea, but we also get older individuals who have already had careers and left because they want to become urban farmers and learn new skills. To paraphrase a different urban farmer, Mud Baron from Pasadena: Gardening is for self, and farming is for others. That's one of the things we try to emphasize—this is a public service, not just something you're doing at home. Because we have a service-learning component, this requires a lot of activity.

We make no bones about it that this is a very active situation. You have to be willing to put in the work, rain or shine. Generally the first few weeks I spend getting right into it, and kind of showing people not necessarily the extremes but the reality of what is expected every single day in this career. Some people stick with it, and other people will drop out in the first few weeks. We try to make it clear very early on that this is a vocational program focused on farming—this is not for hobby gardeners, necessarily, just looking to get tips and tricks to grow better tomatoes.

What is your vision for the future of the farm?

One of the things we're focused on doing is being able to measure our production better, and how we can get produce to market and generate more revenue. We emphasize technology, and how we can use technology to improve not only our own operation but essentially creating a network. We're going to be getting a new shed—we would like to get some solar panels on it, as well as a Wi-Fi hub. We feel there is definitely a market for being able to create "smart farms." As an urban farmer my time is very limited, but if I have 10 lots and I can network all 10 of those lots from my iPad, I can then adjust irrigation and complete other tasks remotely. We're really trying to look at how to use technology more on the farm in order to use time better in becoming more effective in providing a great product.

PERMACULTURE WORLD EVENTS

South East Asian Bioregional Permaculture Convergence

November 16th to 30th 2015

Ilagan Capitol, Isabela, Philippines

http://www.seapc2015.com/program_proper.php

OCTOBER 2016

The 13th Australasian Permaculture Convergence – PERTH W.A

2016 Still in planning but start marking your calendars with the following tentative dates:

3rd October 2016 - Permaculture public EXPO/Fair

3rd October 2016 - Convergence Welcome Dinner

4th October 2016 - Part 1 of 2 Day Permaculture Convergence

5th October 2016 - Part 2 of 2 Day Permaculture Convergence

6-7th October 2016 - Concurrent Tours (Tentative: Two day south tour, two day north tour, 1 day Perth Tour, 1 day Hills Tour)

8th October 2016 - Post APC Master Classes (booked by us)

9th October 2016 - Rest Day

10-14th October 2016 - Concurrent Courses - Advanced Teacher training and Dynamic Groups (or similar)

For more information join the Facebook group:

<https://www.facebook.com/groups/1625742390991220/>

THE BENEFITS OF BEING A FINANCIAL MEMBER OF PERMACULTURE CAIRNS

Eleven Monthly meetings, with information, movies/videos and presentations from informative and interesting guest speakers and members. Plant of the month, Tool of the Month, Tip of the Month, Book of the Month, Cuppa and nibbles and networking time

Discount on most Workshop Fees organised by Permaculture Cairns

Learn more skill by attending Workshops, Permibeas, Tours, information nights and events

Learn more about Permaculture Practices and Principles by attending Meetings, Workshops, Permibeas.

Access to tropical vegetable plants and seeds and other resources.

Monthly Newsletter with local info on workshops and events and Permaculture news from around the world

Networking with people of similar interests from other organisations in the area eg. Seed Saver Groups,

Biodynamic Group, Local Exchange Trading System aka LETS, Community Garden Groups, Non-

Government Organisations like Terrain and Northern Gulf Resource Management Group.

Receive email notices of Events/ Courses by Permaculture Cairns, other relevant businesses/organisations - not all of these notices will be in our newsletters if the news was received after the issue date.

Free access to our Library books on a wide range of Permaculture subjects

Continue learning about Permaculture through shared knowledge and experience

Learn how to live gently on this earth – Care for the Earth, Care for People and Share you excess plants, seeds, knowledge, produce and skills.

Meet and make new friends.

MEMBERSHIP FEES FOR 2015 ARE HALF PRICE TILL THE END OF THIS YEAR.

PERMACULTURE CAIRNS Inc. 2015 AGM NOMINATION FORM

I hereby nominate Permaculture Cairns member _____

for the position of _____
in the election of office bearers at the Annual General Meeting of the Society to be held on 15th December 2015 (or at any adjournment of that meeting).

Name of nominee: _____

Signed by nominee: _____

Dated: _____ / _____ / 2015

Seconded by: _____

Signed: _____

Dated: _____ / _____ / 2015

I hereby agree to accept nomination for the abovementioned position.

Signed: _____

Dated: _____ / _____ / 2015

If you wish to nominate a person for a position on the committee please complete and lodge (email to info@permaculturecairns.org.au) or with a committee member by the 17th November 2015.

PERMACULTURE CAIRNS INC. 2015 AGM APPOINTMENT OF PROXY FORM

I hereby appoint _____ to vote on my behalf as my proxy at

Permaculture Cairns Annual General Meeting (or any adjournment thereof) to be held on

15TH December 2015. Should the first proxy referred to above be unable to attend the meeting, I appoint _____ as an alternate proxy.

I confirm that I am a financial member of Permaculture Cairns Inc. entitled as such to vote at the meeting. I also acknowledge that should I attend the meeting and vote in my own right, my proxy is automatically revoked.

Name: _____ Witness: _____

Signed: _____ Signed: _____

Dated: _____ / _____ / 2015

The proxy form is to allow you to vote, if you are a financial member and would like to vote but cannot be at the meeting. The proxy form must be lodged with the Secretary before the beginning of the meeting.

Please note Memberships fees for 2016 are due and payable on the 1st January 2016

Please PRINT – SIGN – SCAN and RETURN by email to
treasurer@permaculturecairns.org.au.



Permaculture Cairns

Membership Form 2015

One year's membership fee - 1 Jan – 31 Dec:

☐ Household membership \$30 ☐ Renewing Member ☐

Individual membership \$20 ☐ New Member ☐

Name(s) of all applicant(s) & DOB if under 18yrs:

.....
.....
.....

Postal Address:

..... Postcode:

Phone(s):

Email:

Signature:

Payment may be made at Meetings, at Cairns Penny or Online Direct Deposit to Permaculture Cairns A/c at Cairns Penny in Grafton Street. BSB704-966 A/c No. 100009440 please include your Surname as reference.

If you have a Permaculture Design Certificate could you please complete the following survey.

YOUR NAME:

Who was the Course Presenter:

When did you do the Course:

Where did you do the Course:

Permaculture Cairns Public Meetings - All Welcome Third Tuesday of month Feb to Nov (Second Tuesday Dec). Doors open 6pm, meeting starts at 6.30pm at: ARC Disability Centre, 92 Little Street, Manunda

Enquiries

President: Carol Laing workshops@permaculturecairns.org.au
Secretary: Peter Spooner info@permaculturecairns.org.au
Treasurer: Jenny McGrath treasurer@permaculturecairns.org.au
Website: www.permaculturecairns.org.au