Community-based production of virgin coconut oil has made a significant contribution to raising the standard of living of several villages in Solomon Islands. Virgin coconut oil is highly valued in urban and export markets and can substitute at the village level for several costly imported products. Its production also results in useful by-products such as feed-meal for pigs and hens. Development on this basis can be socially, economically and ecologically sustainable, but only if it is carefully managed. However virgin coconut oil production in other Pacific islands has achieved some success, high-value niche products by their nature constitute a relatively limited market. It is therefore unrealistic to expect virgin coconut oil production to be the salvation of more than a small percentage of rural communities.

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The outer islands of the Pacific are characterised by largely subsistence economies with high transport costs to and from each country’s ‘metropolitan centre’. Almost all such places do, however, have a reasonably abundant supply of coconuts. Noticing that traditional copra production from these coconuts was yielding only meagre returns to villages in the outer islands, Dan Etherington (an Australian agricultural economist) was inspired to develop a technology that could produce a wider range of products and yield better returns. Direct micro-expelling (DME) enables village-level production of virgin coconut oil, which has much higher value than copra-oil and yields many useful by-products in an environmentally friendly process, thereby contributing to the sustainable development of such communities.

The encouraging results achieved with virgin coconut oil production in Solomon Islands have been recognised by the Asia Pacific Forum for Economic Development (APFED),¹ which awarded a gold prize in 2007 to Kokonut Pacific Solomon Islands for its contribution to sustainable development. Etherington was subsequently made a Member of the Order of Australia for ‘his services to sustainable agricultural and economic development in the South Pacific’.

This paper first outlines the social and economic potential of virgin coconut
Virgin coconut oil as a tool for sustainable development in outer islands

Oil production and describes the DME technology. We then evaluate its progress to date in Solomon Islands and briefly compare experiences with other Pacific islands, particularly Samoa and Fiji. Our findings are based on a field trip to two production sites on Malaita in Solomon Islands in August 2007 and subsequent background research. We emphasise that those involved are ‘learning by doing’, so things are still evolving.

A scenario for development of the outer islands

The development of virgin coconut oil in the Pacific owes much to Kokonut Pacific (Australia) (KPA), which is a small company specialising in the provision of technology and back-up services to make more effective use of one of the few renewable resources that outer islands have in abundance—namely, coconuts. In this section, we summarise the microeconomic scenario for an outer-island village set out by Etherington (2005). For further information about KPA and its aims and modalities, readers are referred to the company’s web site (www.kokonutpacific.com.au).

Traditionally, the only cash income from coconuts came from selling the dried flesh (copra) to be turned into coconut oil, usually in the metropolitan centres of the country. The price for copra-oil in international markets has, for decades, not only been in significant secular decline, it has been highly volatile. The considerably lower prices paid to copra producers have behaved in a similar fashion. As world prices declined, many farmers abandoned their coconut groves and simply collected enough nuts for their household needs and for feeding their livestock, principally pigs. In Solomon Islands, the price disincentive for copra production was aggravated by political instability, poor management of marketing boards and the environmental impact of logging and cyclones. Only where there was no alternative source of cash did village-level copra production continue. In Fiji, for example, production of copra fell from 30,800 tonnes in 1977 to 11,500 tonnes in 1997, and has remained at about that level (Fiji Bureau of Statistics 2007).

As described below, there are many more uses for a coconut and a coconut tree than as a source of copra. Etherington argued that the long-term coconut policy needed to reap the real value of the coconut palms should rely heavily on alternatives to copra and should introduce appropriate coconut-processing technologies that matched the factor proportions as well as engaging local knowledge. A key to success is wider participation of men and women, and dovetailing products to niche markets and domestic demand. Modern small-scale processing technologies that allow for the commercial production of virgin coconut oil at a farm level offer new hope for the coconut growers of the region.

Ultimately, Etherington hopes for a sustainable microeconomic system, as indicated in Figure 1. The key difference between this hoped-for scenario and what more often happens now is that in the sustainable scenario goods circulate mainly in the local area, along with the associated cash. In contrast, at present, much money goes towards the importation of fuel, building materials and other consumer items (for many of which there could in principle be local substitutes) and the money coming back from the metropolis is ‘diluted’ by the distance effects indicated in Figure 2.
Coconut-oil production technology

The labour-intensive DME technology that KPA developed offers a means of taking advantage of the low costs of labour and nuts at the village level, especially in comparison with the costs of imported fuel and oil. DME gets its name from the fact that it is direct in the sense that it ‘strikes oil’ within an hour of cracking a nut open. It is micro as it is a small-scale operation employing four to six adults to expel the oil. Such units have been producing 30–50 litres of oil a day on a regular basis. The DME process involves grating the flesh of fresh mature coconuts, weighing a batch and drying it on a purpose-built dryer (fuelled by shell and husk) and pressing out the oil in a manual press. Although some care is needed, especially during the drying stage, villagers have found the process fairly easy to learn.

DME virgin coconut oil is a pure, natural and stable final product with a long shelf life. It is a clear, colourless liquid with a faint, sweet smell, with free fatty acid levels as low as 0.1 per cent and a significant content of antioxidants (a selling point for a ‘health food’) and other volatile components.

In contrast, copra-oil is often not pressed from the dried flesh until months after it has been harvested and has been left to lie around in sacks. The oil is pressed in large industrial presses under heated conditions (to maximise the yield) and is (in its initial

Figure 1 A sustainable development scenario for an outer-island village

Virgin coconut oil as a tool for sustainable development in outer islands

state) dirty-brown in colour and smelly. For sale as ‘food-grade’ oil, it has to be filtered, refined, bleached and/or solvents are used to extract impurities. The end product is about the same colour and clarity as beer, but with a strong (though not unpleasant) smell (which can be removed by a deodorising process); it has virtually no antioxidants but the fatty acid composition of the oil is very similar to virgin coconut oil. A less-refined product is used for soap making and other industrial purposes.

The total world market for copra-oil is about two million tonnes and is static or declining; the dominant producers are the Philippines and Thailand. The much more specialised market for virgin coconut oil is about only 2,000 tonnes, but is still growing.

Uses of coconut oil and by-products

Export and urban markets

The market for virgin coconut oil in Europe, Canada, the United States and Australia is growing, especially as a health food. For such consumers, who pay well but are fickle

Figure 2  Indicating how the prices of imported goods (notably diesel fuel) increase as one moves away from the major port of an island group, while wages and the price paid for copra and coconuts decreases

![Diagram](image)

Note: Prices given are notionally in 2000 Australian dollars, but the ratios are more important than the real values.

(subject to fads), selling points include not only the appearance and chemistry of the product but its ‘fair-trade’ origins and its being an ‘organic product’. The price of an organic product in these export markets increases if it is certified by an external agency; such certification is, however, bothersome and is not cheap: it requires a paper trail audited by an international agency all the way from the grower to the consumer, so many producers who market independently do not bother to apply.

When KPA began to market bulk virgin coconut oil about five years ago, there were few other producers; now there is much more competition, particularly from the Philippines. The world price for virgin coconut oil is therefore falling. Some of the large coconut businesses in the Philippines (who are major producers of desiccated coconut and tinned coconut cream, which are also made from freshly split nuts) have diverted a portion of their nuts to virgin presses as an alternative product line. Although virgin coconut oil is only a small proportion of their output, it is still large-scale relative to output from the Pacific islands. With their overheads covered by their main product lines, some Philippines producers are selling virgin coconut oil wholesale for less than A$4 a litre, and for small producers this is hard to match.

Even in the islands, there is a significant urban and hotel market for fine-flavoured vegetable oil. Virgin coconut oil is marketed as an alternative to imported extra virgin olive oil (which is likewise a cold-pressed, better-quality product than bulk [hot-pressed] olive oil). In island capitals such as Suva, the coconut version is significantly cheaper (Table 1).

Another high-value market for virgin coconut oil is in cosmetics; but, although prices are high, quantities are relatively small. A small package of scented body oil retails for about A$50 a litre, which is about five times the retail price of virgin coconut oil (in Suva). There are several producers in Fiji that sell mainly into the large market of visiting tourists, but which also export.

**Bio-fuel**

It is technically possible to run most diesel engines on coconut oil, provided the temperature is above the clouding point of coconut oil (~24°C). Some technical issues, however, require attention if the engine is

| Product                                           | Price (A$/litre)
|---------------------------------------------------|----------------
| Canola oil (imported)                             | 2.70
| Food-grade coconut oil (refined from copra-oil)   | 2.70
| Virgin coconut oil (produced by DME)              | 6.50
| Italian ‘extra virgin’ olive oil                  | 12.00
| Coconut body lotion (scented, in 60ml bottles)    | 57.60

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* prices converted at A$1 = F$1.30

**Note:** All prices have been converted to Australian dollars, using the following indicative exchange rates, which represented averages in 2007: A$1 = US$0.80 = SI$6.50 = F$1.30
to run for more than a few hours without damage. In particular, only some diesel engines (those with ‘indirect injection’) can run on coconut oil for an extended period without problems; and even then: a) the oil needs to be filtered, and b) the engine needs minor modifications, notably to preheat the oil so it flows more freely. Using a mixture of diesel and (filtered) coconut oil is another way to help the fuel run freely enough. For details, see Cloin (2007).

In response to recent hikes in the price of petroleum products, there is worldwide interest in vegetable oils as bio-fuels. This interest has recently boosted the price of copra-oil (Figure 3), but not sufficiently to make copra production attractive to remote villages.

To use virgin coconut oil for fuel (for transport or electricity generation) when it can be sold for a much higher price than diesel fuel is not rational economically, but it could be sensible to use locally pressed oil for this purpose in some circumstances. One such circumstance is to use the ‘reject-grade oil’, although this requires extra care—for example, in filtration, or the engine will fail rapidly. Another circumstance is when imported diesel is locally unavailable—for example, because of the (all too common) vagaries of inter-island shipping. In several of the DME sites in Solomon Islands, the villagers use some of their oil as fuel, in particular for the small diesel generator that powers the grater in the DME system.

Figure 3 Prices for coconut oil and diesel oil

Notes: Prices are in Apia, as they would be for the Electric Power Corporation of Samoa. Price of ADO [automotive distillate, i.e. diesel fuel] is landed but tax-free; price of CNO [coconut oil] is for copra oil in bulk, not for virgin oil.
Source: Data supplied by the Pacific Islands Applied Geoscience Commission, Suva, Fiji
Other local uses

Virgin coconut oil is being used in producer villages for other applications.

- Lamps (as a substitute for kerosene). In this case, the oil quality is much less critical than for use in engines, and relative prices for coconut oil and kerosene make this an economic proposition in outer islands.
- Soap-making. High-grade oil makes high-grade (soft) soap, which can be used locally, or scented and sold to the urban and tourist markets.
- Massage oil (for babies and others), scented or unscented.

Although coconut is traditionally used in many ways for cooking in the Pacific islands, notably as coconut cream (lolo), use of coconut oil for this purpose is rare. Local use of other parts of the coconut, which are by-products of the pressing process, makes the economics of virgin coconut oil production even more favourable for the village, as indicated in Figure 1. In particular, meal (the residual flesh after pressing) makes an excellent feed for pigs and hens, and is used widely for this purpose. The empty coconut shells make excellent fuel for the heaters used in the DME process and for kitchen stoves. It is well established that the shells can also make good charcoal, even activated charcoal, which is a very high-value product. These markets have not, however, been attempted in Solomon Islands, as far as we know, and might not be suitable for village producers.

Virgin coconut oil infrastructure in Solomon Islands

KPA’s experience suggests that a successful future for micro-enterprises requires a focused organisational structure with regular oil-collection schedules, payment to producers, quality control, credit and marketing. In the Solomon Islands, therefore, KPA has set up Kokonut Pacific Solomon Islands (KPSI) as a joint venture with a local company (Pro Solutions Limited). The local partner provides local information, knowledge and management expertise, while KPA provides support for equipment, training and export marketing for organically certified virgin coconut oil. KPSI has established a hierarchical system in which village press units are supported by regional centres on their island and country headquarters in Honiara. Having such an organisation in place has facilitated the process of gaining internationally accredited ‘certified organic’ status. This has proved to be a significant step in gaining access to the international niche market for virgin coconut oil.

DME units source coconuts from local farmers. In 2007, some 352 farmers and 3,628 hectares of land were tapped for the production of virgin coconut oil by KPSI. The number of farmers delivering to a unit varies from one to 46.

As elsewhere in the Pacific, in Solomon Islands, the amount of oil being produced is considerably more than can be absorbed by the domestic market. KPSI exports about 30 tonnes of virgin coconut oil a year to KPA, which markets it internationally.

Local management of the production site

About four to six people are employed for each press unit. A supervisor is employed, whose primary role is to keep the place in order, maintain the employee records, take care of each batch of oil and also of hygiene and quality issues. Others at the site work splitting and grating the coconuts, drying and finally squeezing the grated coconuts. Coconut oil from each batch is measured before pouring it into a barrel. The barrels
are left to settle for at least a week before shipping to KPSI.

The workers receive training from KPSI. The procedures required to produce oil of consistently good quality have to be carefully followed but are simple to apply and easily learnt. For continuing support, a KPSI service centre extension worker visits each site every three months to ensure that any outstanding issues are resolved (for example, minor repairs and spare parts). Repairs are usually minimal. The DME presses are under warranty from KPA, normally for five years. The diesel engine (which powers the grater) can have an occasional problem.

At the local level, a plus is that the work can go on at a pace that island people are comfortable with. They can declare holidays or do double shifts as and when required by local custom, or by demand for cash. For an efficient unit with a large number of farmers, the supply of nuts adjusts itself through informal communication (the ‘coconut wireless’).

The challenges of DME have included such issues as the sharing of the benefits of paid employment; feelings of jealousy towards those in leadership at a site (and between families); absenteeism of trained personnel; and discipline in maintaining quality control. Such problems are typical ‘teething problems with any new technology. KPSI has found that the constructive sharing of the problems can lead to a village-designed solution. For example, with respect to the authority of the team leader in the DME operation, a parallel was drawn with the role of a canoe captain who has authority at sea but whose authority ceases once he returns to the village.

Supply chain

Coconut farm owners collect coconuts when they are ripe (and fall naturally) and sell them to the local virgin coconut oil producer (DME unit owner). The local virgin coconut oil producer maintains a list of coconut sellers and codes to keep track of the produce from each farm, which is essential for organic certification. Each producer ships to KPSI in Honiara every two to four weeks, depending on shipping schedules; such variations allow a buffer and do not affect product quality. KPSI keeps separate track of each of its 25 producers (with a view to organic certification) and does quality testing on the oil for its colour, odour, fatty acid content and any impurities. After testing each barrel, the oil is consolidated into large tanks, filtered twice to remove impurities and settled for at least 15 days. It is tested again before shipping, which takes place every three to five months—to KPA (mostly) or to a direct buyer on behalf of KPA.

Producer’s capital

KPSI has been able to sell about 25 DME units in Solomon Islands, mostly on Malaita. The initial capital cost of at least A$6,000 is beyond the reach of most village communities without assistance. Banks, including the Solomon Islands Development Bank, have been reluctant to provide such funding. Most of these DME units have therefore been sponsored by aid agencies, except for two units that were self-financed by individuals. The amount of the grant given by donors varies with each donor.

Based on data from KPSI, it appears that of eight organisations whose capital costs were fully paid by the Solomon Islands government, only about three are doing well; the rest have some management issues. This is a common experience in the Pacific islands that is all too often forgotten by donors. A piece of equipment that is simply ‘dropped’ on a village will be abandoned as soon as the villagers lose interest or when even a small technical problem occurs,
unless someone in the community has a strong personal and financial interest in keeping it going and technical support is readily available (or at the very least in-country).

For this reason, KPSI has asked for cost sharing by the producer for all 10 units that it has funded. The other major donors are the Solomon Islands government, the Australian government’s development agency AusAID, Canada Fund, EU Micro Projects and Rotary New Zealand. Most of the international donors have also provided grants only on a cost-sharing basis, ranging from 20 per cent to 50 per cent, encouraging local commitment. KPSI does not see itself as a fund-raising body, nor does it seek any involvement in whom the funding agencies choose as grantees. Instead, it gives general guidelines to agencies and detailed budgets to prospective operators.

Our data indicate that about 10 new DME units were installed in 2007, which was rather less than KPSI had aimed for.

Financial returns

Although the processing workers and farmers interviewed shared a lot of information, they were reluctant to give details about their cash flow and income, perhaps for cultural reasons or even because of ‘research fatigue’. Nevertheless, we can make some informative estimates based on aggregate data. The figures are only indicative because they are based on averages and also because prices up and down the supply chain vary with the price paid by the ultimate consumer.

Returns to the farmer

For each batch of about 100 coconuts, the farmer receives about A$3 from the virgin coconut oil producer. This is two to three times what he would receive for nuts going into copra. KPSI ensures that farmers are paid within 15 days, which is important for the farmer in meeting social obligations.

Returns to the virgin coconut oil producer

One kilogram of oil (equal to 1.1 litres) is produced from 12–15 coconuts. Taking a mean figure, this implies that raw material costs to the producer are about A$0.33 a litre of oil. The oil is sold to KPSI for about A$1.50 a litre (at the press site). The producer therefore has a gross margin of A$1.20 a litre, from which he has to pay for labour and the cost of capital.

With five workers and a notional labour cost of A$1 an hour (not atypical in the rural Pacific), the labour cost would be about A$30 a day. For an output of 50 litres a day, the cost of labour is about A$0.60 for each litre of oil. (In practice, labour in the rural Pacific islands is paid on a task basis rather than by the hour.)

Dividing the virgin coconut oil production of Solomon Islands (30 tonnes per annum) notionally among the 25 production units (presses) implies an average production of 1,500 litres per annum, which, at A$1.50 a litre, gives a gross yield of A$2,200 a year to the producer, corresponding with A$1,100 net of labour costs.

KPA sells a DME press kit for about A$6,000 (ex Canberra), but it estimates that the total cost of setting up a production unit is more like A$15,000 (including sheds and access to them, containers, dryers and other ancillary equipment, and freight on these items). The return on total capital invested would therefore be in the order of A$1,100 per annum per A$15,000 = 7.3 per cent per annum. In fact, the return to a successful producer is generally better than this—for two reasons. First, his personal investment is often less than 100 per cent of the capital costs (only 25 per cent for some operators in Solomon Islands). Second, the yield used
above to calculate the rate of return is based on average production, whereas the more successful operators obviously produce more. In short, a well-run DME operation is economically sustainable.

**Downstream sales**

Prices paid to the producer and to the farmer depend on prices paid further along the supply chain. At the time of our research (2007), virgin coconut oil sold at a press in Malaita for the local market for SI$12 (A$2) a litre, but at the head office of KPSI in Honiara it was selling for A$4 a litre. These prices are about triple that for copra-oil. The wholesale price of good-quality oil in Australia and in other industrial-country markets into which KPA sells virgin coconut oil is roughly A$8 a litre. A comparison of retail prices for virgin coconut oil and related and competing products is given in Table 1; note particularly the very high value of the cosmetic product.

**Contribution to sustainable development**

In the more remote parts of Solomon Islands, communities have a basically subsistence lifestyle. There has been virtually no paid employment and almost no cash crops, except for copra, for which the returns are derisory. This has made it difficult for people to purchase trade goods (for example, tools) or fund education for their children. The introduction of DME has provided a new source of cash and active employment, and the benefits are shared by an extended group of villagers. By paying more for coconuts than for copra, it has stimulated villagers to collect the nuts for sale. The production workers receive cash. Since the producer (press) is closely connected with the community, much of the returns flow into the community. Having a shared and purposeful enterprise is a social good in itself.

Moreover, as noted above, the by-products, particularly meal, are also of value to the community. Although the meal goes rancid too quickly for it to be sold far from its source, it can make a significant contribution to the nutrition of the villagers as food for pigs and chickens.

Since the coconut trees are producing coconuts anyway and the processing has no noxious outputs and does not use other resources, and the by-products of the process are being fully utilised, virgin coconut oil production is environmentally sustainable.

**Experience elsewhere with virgin coconut oil**

KPA has helped set up DME units across the South Pacific, including in the Marshall Islands, Kiribati, Papua New Guinea, Vanuatu, Fiji, Samoa and Tonga. Many of the units are isolated and cater for local demand. For example, some are directly linked with boarding schools, where the oil is used for cooking, making soap and as a fuel for diesel generators. KPA has also supported a few ventures in Africa.

An integration and marketing service such as the one KPA provides is clearly very useful, and has made a major contribution to the viability of virgin coconut oil production in Solomon Islands. In other countries, these services to villages producing virgin coconut oil have been provided by independent entrepreneurs—often with personal connections to the village—who have put up the initial capital and have a strong interest in making the village producers and their own downstream businesses viable. Several successful small businesses in Fiji operate in this mode.
One reason for the success in Fiji is access to its relatively large tourist industry. In particular, tourists constitute a ready and accessible market for cosmetic products (including high-grade soap) produced from virgin coconut oil.

Fiji also has one virgin coconut oil producer operating on a larger scale, with production of about 200 tonnes a year. This operation is based on a long-established, commercial coconut plantation in Taveuni, and its output is exported into the organic food market. At this scale, the production process is highly mechanised.

In Samoa, a cooperative called Women in Business Development Incorporated (WIB) has taken on the integration and marketing role and has secured an export contract with a major international cosmetic company (the Body Shop) for up to 30 tonnes a year (Nadkarni 2008; Oxfam 2008). With assistance from Oxfam and New Zealand Aid, WIB operates as a provider of micro-finance. It supports about 13 press units, operated as cooperatives, which are able to pay the 200 or so organic farmers about A$3 for each kilogram of oil plus 50 cents for a community development fund. Most of their hand-presses are made in New Zealand. Virgin coconut oil from Samoa is also exported through a New Zealand-based company, which uses the oil’s status as ‘organic’ and ‘fair trade’ to access high-value niche markets.

The importance of having a downstream marketing infrastructure and a local entrepreneur with a direct financial interest in the success of each virgin coconut oil venture is underlined by the experience in Tuvalu, where this appears not to have been the case. In about 2003, the European Union financed small cold-press systems for making oil, paid for marketing studies, trained people to use them on all atolls and subsidised or paid salaries for about 12 months. The output was primarily for body oil or cooking oil rather than for fuel. By 2006, most of the presses were reported to be unused (P. Johnston, pers. comm.).

In Papua New Guinea, a firm called Project Support Services is reported to have manufactured and sold hundreds of hand-presses for village-based production of cooking oil, body oil and soap for local use. Their presses are capable of continuous operation (not batch), but are not designed to produce high-grade food oil (A. de Wilde, pers. comm.).

The Philippines has some small-scale virgin coconut oil producers, in addition to the industrial producers that dominate world markets for coconut products. Some of these small virgin coconut oil producers are reported to use a new, so-called ‘fermentation’ technology, which bypasses mechanical pressing and is therefore less capital intensive than the DME technology. This technology has yet to be tested for yield and quality in the Pacific.

Conclusions and future prospects

As recognised by the APFED prize, Kokonut Pacific has made a significant contribution to raising the standard of living in several Solomon Islands villages, through village-based production of virgin coconut oil. The DME technology they championed is innovative and appropriate for such use. Virgin coconut oil has high value for sale in urban and export markets and can substitute at the village level for several costly imported products; its production also makes useful by-products such as feed-meal for pigs and hens. Development on this basis can be socially, economically and ecologically sustainable, but only if it is carefully managed. Experience suggests, however, that such enterprises are sustainable only if someone in the community has a strong (financial) interest in making the village
producers and the downstream operation viable. The infrastructure for downstream marketing (especially for export) and for training and technical back-up is also vital. Kokonut Pacific has provided these services in Solomon Islands.

The major export markets for virgin coconut oil are as an organic health food and as the base for specialised cosmetics. It is, however, becoming more difficult to compete in these niche markets because industrial-scale producers from the Philippines are vigorously entering these markets.

In those Pacific island countries where there is a substantial tourist presence, there is a significant market (or potential market) for high-value, coconut-based cosmetics (body oils) and soaps. This market is well developed in Fiji, for example. It can be brought even closer to the virgin coconut oil producers by linkages with ‘eco-tourism’ resorts, which are usually in the remoter parts of an island group—just like the coconut producers.

The success of virgin coconut oil-producing villages in Solomon Islands has been replicated in other Pacific island countries, notably Fiji and Samoa. High-value niche products, however, by their very nature, constitute a relatively limited market; it is unrealistic therefore to expect virgin coconut oil production to be the salvation of more than a fairly small percentage of rural communities.

Acknowledgments

This paper is based on a field trip by Shashi Kad to two production sites on Malaita in Solomon Islands in August 2007 and background research by Tony Weir. We thank Colin Dyer of KPSI for help with arranging the field trip and for many informative discussions. We also thank KPA (especially Richard Etherington) for discussions about markets for virgin coconut oil and for permission to quote from their published papers. We also acknowledge useful discussions with Peni Drodrolagi, Peter Johnston, Jan Cloin and the Coconut Industry Development Authority of Fiji. We thank the Institute for Global Environmental Strategies and APFED for funding and other support for this research, and two anonymous referees for their comments.

References


Notes

1. APFED is a consortium of research institutions, including the two where the two authors work.

2. To obtain a high yield (litres of oil per coconut), fairly strong pressure must be applied. In Fiji, this has been known to tempt big strong-men to jump on the lever arm to try to maximise the pressure; this usually
breaks the safety shear-bolt in the press. As high uniform pressure is most productive, one operator in Fiji has modified the press to include a hydraulic device to clamp on the pressure.

3 All prices have been converted to Australian dollars, using the following indicative exchange rates, which represented averages in 2007: A$1 = US$0.80 = SI$6.50 = F$1.30.

4 In Solomon Islands at least, most of the producers are male, although the virgin coconut oil production workers include women.

5 This indicative estimate comes from the KPA web site, which also provides a ‘calculator’ to make a better estimate based on local prices for the various inputs.