

Changing household behaviours: learning for urban sustainability

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Abstract

This paper provides some reflections on lessons learned from the first five years of the Sustainable Households Programme in New Zealand. This programme is a community education initiative to support the introduction of more sustainable actions in New Zealand households. The paper begins by describing the Programme's development, and then examines the underlying learning theory which contributes to the programme's success. The paper then looks in more detail at the programme's audience and the subsequent changes they make in their household management as a result of the course. The programme also looks at areas that are harder to address. Finally some suggestions are made for other government agencies thinking about introducing similar programmes. ...

Keywords: Sustainability; community education; environment; social learning; motivation; behaviour change; networks; facilitation.

Introduction

Developed consumer societies such as New Zealand demonstrate a per-person flow of materials and energy at rates that many reviewers suggest is well above the long-term carrying capacity of the planet (e.g. Wackernagel & Rees 1996; PCE 2002, 2004; Worldwatch Institute 2003, 2004). As one response to this New Zealand local government created the Sustainable Households Programme. This provides education towards action such as less resource-wasteful or polluting practices, starting with everyday household decisions (MfE/MFAT 2002, p.33). Based on community education activity, it offers a mix of tutored evening class series, informal study groups, single-topic seminars and public websites.

The programme targets active information-seekers, by using the community education model. It aims to help people voluntarily learn their way into more sustainable lifestyles that can meet their material and quality-of-life needs, representing a form of "education for sustainable development" (López 2000), and "building of social capital" (Pretty & Frank 2000).

This paper reviews the Sustainable Households Programme during and the effects since its pilot years 2001-2004. It begins by describing the Programme's development, and then examines the underlying learning theory. Subsequent sections look in turn at its approach, impacts, and some barriers to pro-sustainability behaviour uptake.

Enquiry methods

Lessons from the development and implementation of the programme are developed using exploratory social research approaches. One of the paper's co-authors, Rhys Taylor, has been a contracted coordinator and tutor within the programme, gaining an 'insider view' which has informed his separately-funded role as researcher. The lessons that are set out here draw on the comments made by participants at entry and exit from the programme. A further set of

telephone interviews have provided reflections from a sample of participants two years after they went through the course. The authors have also drawn on two reviews of the programme undertaken during this period (Wartman, 2003; McDonald & Bielby 2004). The observations reported here are, where possible, triangulated with research literature from areas including sustainable development, education and behaviour change.

Origins of the Sustainable Households Programme

In 2000 a national meeting of environmental education officers from local government proposed that a community education programme be created on domestic sustainability issues, by pooling the modest resources available for such work in the community, outside the school curriculum. The Programme reflects principles of 'education about and for the environment' in the New Zealand Guidelines for Environmental Education (Blakeley et al. 1999). It was inspired in part by concepts of transformative education for sustainability (Stirling 1999) and community development through adult education (Scott et al 1989).

Eight of the 85 New Zealand local government councils developed a pilot project in 2001. Marlborough District Council's Education Officer led the collaborative pilot project. Originally named Sustainable Households, it was assisted for its first three years by funding from the Ministry for the Environment. The programme has now expanded and is currently (mid 2007) being offered by 19 councils. Earlier this year the programme has been renamed as the Sustainable Living Programme.

The Programme provides one method for councils to implement responsibilities for education for sustainable development under Chapter Six of UN *Agenda 21* and for promoting sustainability 'wellbeings' under the NZ Local Government Act 2002. It fits with statutory roles and powers to promote voluntary methods in resource management, solid waste reduction and recycling, water supply, waste treatment, energy efficiency, air quality, public transport and road traffic management, among others.

Programme operation

Sustainable Households Programme has been designed to bring groups of interested adults together for a timetabled series of 5 to 9 study sessions, each of 2 hours. These are led by a tutor/facilitator and supported by visual aids and reference material, quizzes and activities for group and home, simple resource-use measurements and auditing checklists – a variety that is intended to "enrich the learning" (Taylor & Van Rensburg 2002). The explicit aim is to build awareness, knowledge, and confidence to act and to use peer influence to motivate use of new learning.

The tutor/facilitators use an extensive document set, updated and distributed annually on CD. These contain a facilitation process guide, visual aids, learner handouts and more technical background reference material for tutors, who also have access to support by email and phone. Because the materials are circulated electronically and only printed locally as required, paper wastage is minimised and the handouts for participants can be updated easily.

Recommended domestic actions range from immediate to longer-term planning and include the:

- *immediate* (e.g., saving electricity by switching off lights or equipment on stand-by),
- *mid-term and tactical* (e.g., purchasing compact fluorescent light bulbs that will more than pay for themselves in value of electricity saved over a few years), and
- *long-term and strategic investments* (e.g., when renovating or shifting house, to seek higher thermal mass, better sunshine access, and improved insulation).

Immediately adopting all of the suggestions offered would result in major lifestyle changes in that learner's household, but the design expectation is that participants will pick aspects that most appeal and are attainable in their current circumstances, while learning and remembering more ideas for future use.

Although the Sustainable Households Programme courses are sponsored by local government, their delivery is contracted out to other local partners. Most regions offer the courses through public evening classes run by local colleges and secondary schools. The schools use adult and community education funding to help employ local tutor/facilitators to deliver the course. The participants enroll in advance, paying a class fee (around NZ\$45) to attend.

Recruitment of sufficient participants into each of these timetabled classes proved a challenging task for community education providers in the early years, usually working on small publicity budgets, with limited media access, except where they had council help with marketing. Not all offered classes attracted enough people at that date and time to start, but once under way they have generally retained participants through to completion. Councils were found to have an important promotional role, to build public profile and help recruit course participants. In a few cases Councils have chosen to use staff members or employ facilitators directly, to run single-topic seminars or workshops, offered free to participants.

To reach a wider audience than the evening class and seminar attendees, The Programme developed two websites: first <http://www.sustainablehouseholds.org.nz> and in 2006-7 the more interactive <http://www.sustainableliving.org.nz>. These display a selection of the issues and actions materials, and highlight links to many relevant New Zealand and overseas websites. The sites are attracting a growing number of users (over 3,000 visits per month by 2007), and have been linked-to by more than 200 other websites. Email enquiries about Programme availability have been received by organisers from the public in most regions of NZ.

Underpinning theories of learning

Sustainable Households has used a constructivist learning model to engender understanding of sustainability in a household context. The course is delivered in a learning group context which allows time for internal reassessment of knowledge by the learner. In this approach, different people will assemble understanding by varied routes, building on and refining their previous "knowledge" and life experience. In this model the influence of peers is admitted, which may encourage or discourage learning, so the group experience has to be facilitated.

An independent reviewer of the pilot-stage evening classes (Wartmann 2003), found the Programme "located within an ecological paradigm and includes participation, a collaborative approach to learning, critical thinking, and action *for* the environment" – features in accord with adult education good practice as advocated by Clover et al. (2000) and Stirling (2001)". Wartmann also noted value in the variety of learning styles being addressed.

Often, adult education initiatives to encourage change towards sustainability concentrate on **actions**, such as recycling or saving energy, as their main aim (as the “what”). However, as Horn et al. (2003) point out, the wider literature suggests that successful social change programmes need also to provide **a guiding world view** to help understand “why”, and provide **a supportive social environment** (for the “when and how” to change).

1. **Actions** - include ideas, plans, actions and feedback of experience (in a cycle).
2. **World View** - includes understanding the system and sustainability imperatives.
3. **Supportive social environment** - networking, motivating and assisting the construction of learning

By providing all three elements together in the same course experience, the adult education model can be strengthened. More detail on each of these three elements is shown below; followed by comments on how the elements combine to provide a good learning dynamic.

Actions

To improve environmental performance, one has to know what to do that reduces the household’s impact on the environment. For many people, taking action to change something (and planning more) is the most obvious starting point; hence the popularity of starting with tangible activities such as re-use of household waste and recycling. These activities are based on “tangible” objectives, such as:

- Recycling to divert waste from landfill (throw away less)
- Reducing household fuel and electricity consumption (to save money and carbon)
- Reducing kilometres traveled by car (to save money and carbon).

These objectives appear frequently on international websites with a sustainability theme and are widely recognised starting points for a household trying to reduce its ecological footprint.

Guiding world view

Understanding the bigger picture is important for many adults as part of the learning process. This is consistent with reviewers such as Robert et al. (2002) who point to the importance of helping people understand the current level of human impact on global and local ecosystems. For household participants, the point of this is to apply knowledge of the wider 'global' system to thinking about what goes on in their own homes and 'local' community.

In the Programme this wider context is given in two places. At the beginning of the course participants are introduced to wider notions of sustainability, and briefly to frameworks such as The Natural Step (www.naturalstep.org.nz). Then as each section is introduced, a wider picture is drawn about resource use, pollution, or impacts of current consumer behavior, to indicate “why act”, before detailed actions are proposed and discussed.

Supportive social environment

The basis of encouraging sustainable practices rests on some fundamental understanding of the general social processes of learning and change, which include:

- building capacity for people to learn about and reflect on the effects of their actions
- engaging with others involved in the same processes through building networks.

Accordingly the Programme provides a social environment to help empower people for actively learning about change. It provides the opportunity for them to discuss educational material, both with the tutor and other householder participants, over several weeks. From a constructivist perspective, this gives them a way to contextualize and reshape the content in the light of their personal and local circumstances, and identify opportunities to take action.

Learning together

Studies show that as people age, they come to understand the learning process differently. In primary school, young learners regard learning as “a way to know a lot”– and seek to acquire and memorize information presented by the teacher. By later secondary school, many understand learning as being about acquiring new skills and methods, transferable between topics. Here the learner is trying to learn new ways of thinking and doing, not just remembering “facts”. Advanced, reflective adult learners come to see learning as about understanding the world through asking why and re-interpreting and integrating their growing knowledge (Kegan 1994).

Learners in the early stages of learning need information provided to them by others. Later, they are more likely to seek participation to help them clarify their understanding, and help them move towards action. Long-term change is enabled by a supportive social environment, whereby social links mutually benefit a common purpose (Allen et al. 2002). However, a group has the potential to be all social relationships and “verbalism”, which limits useful content or action (Freire 1970/1996). At the other extreme is “over-activism”, being all action without reflection. The Programme design sought a path between these two, providing a comfortable social setting and sufficient focus on outcomes. The distinction between tutor and learner could be allowed to blur when the study group member’s participation provided relevant content, to draw from experience and reflection (Schon 1983; Hampton & Hampton 1993)

International research suggests that pro-environment attitudes and provision of information are not sufficient on their own to prompt behaviour change (DeYoung 1989; Geurrie 1995; McKenzie-Mohr 2000). However, information’s presentation and acceptance in the context of a social group dialogue increases the rate of uptake. Small new actions prompted both by the content and by fellow participants’ example, proved to be easy to replicate and could be reported back the following week. Then strategic (harder, longer-term) actions would be discussed in a supportive setting, which we learned from interviewees is not necessarily present at their homes or workplaces.

The tutor/facilitator’s written guide, distributed on the national CD, briefs tutors to enable learning through group discussion with a practical focus, rather than to deliver lectures. Their success at providing a setting for learning was acknowledged in many participants’ written comments, such as:

- “It is unpressured – you just give us knowledge and then let us discuss and choose.” (Christchurch)
- “I was hungry for information and felt very inspired by what I learned.” (North Shore)
- “Good way of meeting people in your area whilst learning about great eco-savings. A much needed course” (Waitakere)

Process-evaluation questionnaires show that participation in discussion was greatly valued. Reasons cited were that in their own homes others would not willingly engage time in discussion of these topics (most often reported by women about men) and that while they knew “the right thing to do” from their reading and comments by the tutor, it took group discussion to help them make choices from options, and to “do it right”. Feedback to facilitators was that reading such published information alone may not have achieved this, without making the commitment to join discussion at a course.

The exit questionnaires and telephone survey suggested that the peer group’s impact was at least equal in significance to that of the tutor or the written material, in supporting their individual learning and confidence-building. Participants frequently commented on valuable learning and encouragement from others’ examples and observations in the group.

Programme appeal – recruiting the participants

Participants attracted in the pilot stage were predominantly household-purchase decision makers. Women participants outnumbered men by at least 3 to 1, in both the evening classes and informal study groups. This significant gender difference in programme participation levels should not surprise, as it is found both in adult education generally and among people showing pro-environment values, in Western societies (Zelezny et al. 2000).

Men in full-time work were slightly more likely than women to drop out of the paid-for evening classes. Reasons for early departures are discussed below (see barriers to learning and change), but also a few men and one woman indicated discomfort with the predominant discussion-based learning style: these men said they preferred to get the facts and get straight into action. At the outset, men expressed relatively more interest in learning about, and were then more reliable attendees at, sessions on energy, building and water, than other topics; and women showed proportionately more interest in shopping, waste and travel; but a majority of all participants indicated that it was the comprehensive nature of programme content which appealed, both in prospect and in review.

Age ranges of participants completing the courses were from early 20s to late 70s. Environmental attitudes, measured at the outset, of both series-completers and of the minority who dropped out were very similar, as were their initial learning expectations and the household context such as health issues that they reported.

Some indicated they were motivated to attend by interest in family health improvement and a minority by a wish to save money. The existence of both environmental and health motivations for learning in 2005-6 parallel the factors found in Campbell & Ritchie’s (2002) study of consumer take-up of organic produce in New Zealand. However, these authors’ third-most-important motivator of change, “being fashionable”, was less in evidence here. Programme participants did not give interviewers the impression that they were “surfing the newest consumer wave”, but indicated that they felt they were swimming alone against a strong tide of over-consumption. Participants cited their concerns about repeated exposure to media messages that imply an apparent lack of resource limits upon consumption, plus easy credit terms, which discounted the future.

Perceptions of a need for greater environmental care are known to be widely held in the NZ population despite an enduring myth that the country is ‘clean and green’ (Hughey et al. 2004). Course participants quickly find they share an interest in care of the environment, and this

course did not attract any of the environmentally-hostile. People with no pro-environment attitude would require other social marketing approaches, incentives and/or regulation, to influence them onto a path towards more sustainable lifestyles, as they would not volunteer for course participation. Realistically, this segment of the population may not respond until majority social norms change noticeably around them, which requires others to be the early adopters (Rogers 1995).

In the surveys, course participants were asked how they viewed others and to describe their current lifestyle. From limited-choices, the largest proportion identified with: “a lifestyle in which you consider the environment only when it is reasonable or practical to do so”, and are labeled here as environmental pragmatists. A minority of participants was more eco-centric identifying with: “a lifestyle where you consider the environment in almost everything you do”. The eco-centric course entrants became more satisfied with their lifestyle choice and the environmental pragmatists also more satisfied with their lifestyle, by the course end, each by an average of one step moved up on a 10-step preference scale. Few people slipped back and few showed a transition between these two lifestyles or world views after the course. Group participation increased participants’ confidence to express a pre-existing worldview (in addition to taking action), rather than transforming their values from pragmatic towards the eco-centric.

The ecocentric minority was mostly female, and tended to exhibit stronger convictions than accuracy of knowledge about appropriate actions to take. They reported a previous shortage of reliable information sources and showed confidence to demonstrate that some of their less well informed previous approaches, for example in waste reduction and gardening, had proved ineffective.

This research has identified that course participants are sociable people who arrive with generally pro-environmental values, although only a minority are committed ecocentrics. Many interviewees showed similar interests and characteristic actions to the Cultural Creatives of Ray and Anderson (1996) and to the Lifestyle of Health and Sustainability (LOHAS) quarter of the NZ population recently identified by commercial market researchers (Moxie 2005, repeated 2007). These values predispose them to seek information about why and how to take action on sustainability, and to reflect on the usefulness of current action, which helps overcome barriers and prevent lapses.

Having arrived with a readiness to read, learn and to discuss, course participants used what they learned in subsequent discussion at home. Programme involvement helped some to improve their success rate in debates and decisions at home, with usually less eco-centric family members.

Participants expected change in actions as a result of learning. A majority of surveyed participants agreed with the entry survey statement “I can think of many reasons to continue with my current lifestyle and *many* good reasons to change”. Reasons to change are both emotional (value-based, social attitudes) and rational (information and incentive based), so we examined to what extent participants accessed the rational information content as well as attending the discussions. Exit surveys showed that 70% of participants had read at least three-quarters of the material supplied, and the follow-up telephone sample survey indicated long-term retention of the notes – and some described using them to answer subsequent questions from family or work mates.

What changed and what did not

If Sustainable Households was only concerned with "providing factual resources for consumer education" (Cranton 1994), simply facilitating access to material on these subjects, it would be just a website or a reference leaflet publisher, and not "education for sustainable development". However, the Programme aims to extend beyond the provision of consumer information, to prompt change in the household. Accordingly the exit interviews and subsequent follow-up telephone interviews placed an emphasis on learning about changes that had taken place, as well as areas which proved hard to change. In general the programme achieved traction on impact-oriented behaviour, and struggled to support change in intent oriented behaviours.

Actions taken by learners

"Impact-oriented behaviours" (Stern et al. 1999) are those that can directly cause damage to other people and/or the natural environment, such as polluting streams with paint or oil, spraying crop pesticides that kill bees as well as target insects, using products containing ozone-depleting chemicals, or generating acrid smoke from coal on an open fire. Suggested actions to mitigate such damage have interested the Programme participants. Raising issues created interest in getting factual information, including what local difference their small actions of mitigation could make. There was a readiness to consider changing actions, once the environmental threats and impacts were understood, and for the intrinsic satisfaction of "doing the right thing". Where the environmental impact was less tangible or distant, this applied less strongly, unless there were also economic incentives for greater efficiency in resource use (e.g. electricity, water, non-recyclable plastics, etc.).

The actions most commonly reported by participants were:

- electricity savings, either achieved by behaviour (switching off appliances; taking showers instead of baths) or equipment changes (such as replacing tungsten-filament light bulbs with compact fluorescents; ceasing use of oldest fridge);
- investment in thermal insulation (e.g., layers above ceilings and under floors; hot-water-tank insulating jackets);
- replacement of inefficient, smokey open fireplaces with alternative room-heating arrangements such as electric heat pumps or efficient woodstoves;
- starting to compost, or improving composting efficiency of, kitchen waste and garden clippings which significantly reduces waste volumes to landfill;
- avoiding plastic carrier bags when shopping, taking an alternative durable carrier;
- avoiding "over-packaged" products generally, buying more items in bulk and eschewing plastic packs other than the recyclable codes 1 and 2;
- reading product labels more critically, and recognising some environmental labelling/branding schemes used by business, such as organic certification by BioGro;
- renewed interest in growing fruit and vegetables at home and in buying New Zealand-produced food in season;
- water efficiencies, especially in the garden (lawns allowed to yellow or partly dug up; more use of mulches) and indoors, a switch towards short showers from baths;
- A slight increase in short walking trips where cars were previously used, more cycling, and in car trip-sharing within households or with workmates.

Awareness of energy and waste issues volunteered at participant arrival in the Programme showed these to be the topics where there was most demonstrable motivation to learn and an

expectation of making an impact; and action on these two issues frequently resulted. At participant entry, there was less awareness of the scope for future action within gardening, shopping, water, and travel topics. In relation to these latter topics, the Programme content may provide a greater challenge to prevailing social attitudes. Relatively more information content on these topics was considered new by participants. Participation in these four topics as part of the course gained appreciative reviews and did prompt some action – with the lowest level of change on the travel topic.

Participants were often found to have taken first steps in home energy efficiency, waste reduction or gardening during their programme involvement, and were then (from the follow-up interview evidence) found to be learning and applying subsequently a wider range of the ideas and longer-term investments they were introduced to in the Programme sessions.

Some participants, especially those who found much of the content was new, experienced a sequence, beginning unaware of potential actions, then contemplating change, then moving into preparation for action, which is comparable to work in the medical psychology field of overcoming addictions (Prochaska et al. 1992, 1994). Involvement in the group's regular action-reporting sessions helped to reduce risk of "relapse" into previous environmentally unfriendly behaviour or inaction. This gave the series of regular classes an advantage over the single-issue seminars, in influencing behaviour outcomes.

Things that didn't change

In contrast to impact-orientation, the "intent-oriented behaviours" (of Stern et al.'s 1999 typology) are those driven by generalized or indirect effort to protect the environment, such as beginning to grow vegetables at home, getting regular exercise by walking instead of driving, or avoiding purchase of over-packaged goods. When encountered in the Programme pilot, these intents were usually ones already established. New information content alone was not enough to get people from contemplation into action that broke habits on these behaviours.

Discussion about merit of intent-orientated actions could be prompted in the "safety" of courses and study groups, but turning these attitudes and values into action that could be reported within the few weeks of a course was more difficult. Intent-oriented behaviours are strongly influenced by the context of social norms, fashion, health status, income and concepts of convenience. Action on these is often stymied by barriers such as entry cost, lack of family support, or 'convenient' time to explore them.

Example: car dependence as a prevailing social norm

Car ownership per household in New Zealand is among the highest in the world. A majority of participants at Sustainable Households courses were motorists and arrived there by (second hand) car, with little car-sharing, bus use or cycling, even when these alternatives were explicitly encouraged.

In the questionnaires filled in at the start of the course, participants indicated that they had little expectation that attending the course would make any difference to their travel patterns. Although the travel session's look at environmental and health effects of motoring was considered interesting and the informed debate was welcomed, it remained at the bottom of

the impacts list at series end. This applied even in those households that had meanwhile launched into other environmental sustainability actions.

Changing car-use level was considered “too hard” by many Sustainable Households participants, even though each group and tutor usually included a few who role-modeled successful use of alternative travel modes. Perceived lack of road-safety outside cars, inconvenience from slow journeys, rain and physical discomforts for the traveler were main reasons cited by city participants for not bicycling, walking, or using buses. In rural pilot areas there were few buses or trains available and a prevailing view of “no alternative”.

Participants simultaneously held the conflicting views that cars are bad for city life and good for their own life. Other studies have indicated cognitive dissonance applies to car use, where holding a generally pro-environment attitude is somehow rationalized or adjusted to excuse the driving (Tertoolen 1998).

Conclusion

Declared environmental concern was a common feature of almost all participants enrolling in the programme, for most of whom learning about actions that also support family health was a significant secondary attraction. The Sustainable Households/Living Programme responds to a few of the sustainability “converted” (those already taking some action, who seek support and endorsement before doing more) and to more of the “convertible” (those who would take action, first seeking the motivation and know-how). It builds confidence to act and competence within action, which tackles two a significant barrier between intent and action. It may be argued that while pro-environmental beliefs or attitudes held at the outset predict self-reporting of pro-sustainability actions, only people's belief in their competence to act actually predicts observed behaviour (de Young 2000, when observing recycling behaviour). The intrinsic rewards of enjoyable social participation and reporting small successes with newly-learned actions may also be significant confidence builders, representing empowerment (Page & Czuba 1999).

The programme's group study or class format attracts sociable communicators, predominantly women, from a wide range of educational and cultural backgrounds. Interview evidence shows that their learning experiences are then being shared with other household members and their actions emulated in workplaces and community organisations, which illustrates a social diffusion of ideas (Rogers 1995). Learning is reviewed during the group's meetings, so reflection forms part of the action-learning process (Kolb 1984) although course durations may be too short to complete full learning 'cycles' of action, reflection and planning anew.

When reviewing participants' subsequent action, from follow-up telephone interviews, evidence is emerging from this Programme that the impact on learning of the group involvement, especially of discussing with others why and how to act, is as great as the value of exposure to authoritative information on what to do. Exit evaluations suggest that motivation-strengthening came from the “collective efficacy” of the group (Bandura 1997, 2000; Oskamp 2000) rather than information presentations by the tutor/facilitator. In addition, where the facilitator was able to model good practice in their observed and reported lifestyle participants responded favourably.

Community education programmes such as evening classes are just one in a mix of motivational mechanisms which councils and other government organisations can use to support constructive behaviour change. In particular, public education programmes are most suited to influencing impact-oriented behaviours (such as changing light bulbs, ceasing car washing on roadsides to protect stormwater), while intent-oriented behaviours (such as reducing car use for commuting) may require larger public policy shifts to remove barriers, such as economic incentives and regulatory standards, plus a focus on social psychology to encourage pledges and maintain such commitments (McKenzie-Mohr 2000, Dickerson 1992).

Some participants sought and discussed persuasive reasons to change, in the face of opposition from others in their household or workplace, as well as seeking information on how to do those actions successfully. Parallels emerged to findings in an equivalent UK sustainability study (Burgess et al. 2003), in which the interviewed participants “wanted to be made to think, which is a reversal of the model presumed by communication campaigns; instead of [passively] learning and then acting, these participants are curious, and start debating.”

The Sustainable Households Programme has reached over 1,000 New Zealand consumer “early adopters” However, as these participants were generally not established political, fashion or community leaders it is too early to know if they represent the future role models for societal change. Nonetheless, we hope that in the near future their ordinary stories of change will make interesting case studies that should have a growing media appeal, as global awareness of climate change, impending peak oil production and accumulation of environmental toxins continues to rise.

About the Authors

Rhys E Taylor is an Oxford University BA in Human Sciences in the 1970s started an interdisciplinary career, originally based in the UK, and since 1996 in Canterbury, New Zealand. Rhys has managed applied research and publishing projects on community development and environmental themes for the National Council for Voluntary Organisations and the Association of Rural Community Councils (when in the UK) and for local government and Landcare Research Ltd (in NZ). He has completed three postgraduate certificates: in Local Policy, Adult-Community Education and Management; and a Lincoln University mid-career MSc in Resource Management. Current research focus is on behaviour change for sustainability, and the educational power of future

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